# MOTOR AGE

Vol. XLIII Number 1 PUBLISHED WEEKLY AT THE MAILERS FUILDING CHICAGO, JANUARY 4, 1923

Thirty-five Cents a Copy Three Dollars a Year





Full Set of Champions Means Better Engine Performance

You do the car owner a favor when you sell him a full set of dependable Champion Spark Plugs at least once a year.

Not only does he save the price of the plugs in oil and gas, but his engine will perform better and give better service.

Also new plugs are insurance against ignition faults that may lead to serious motor trouble requiring costly repairs. By selling Champions by the set you increase your turnover and make greater profit.

Champion Spark Plug Co., Toledo, Ohio Champion Spark Plug Co. of Canada, Ltd., Windsor, Ont.

The New and Better Champion is Identified by the Double-Ribbed Core



Champion X is the one spark plug recognized as the standard for Ford cars. trucks and tractors. Millions are in daily use.

# CHAMPION

Dependable for Every Engine



## IMPORTANT ANNOUNCEMENT:

## Another Money-Making Development for Sunbeam Dealers

OU can now buy Sunbeam Visor frames and brackets packed separately—a plan that cuts down your stock investment, speeds turn-over and eliminates "dead" or "slow" items.

Instead of having to carry complete assemblies for all visor widths and bracket styles, you can now fit almost any car by putting in a complete range of brackets only, with about half the usual number of Visor frames. All brackets, "open," "closed" or "special," will fit any Sunbeam Visor frame, enabling you to make up your own combination to fit any car.



Sunbeam Visor frames are now crated individually in SOLID WOODEN BOXES, instead of in corrugated paper cartons as heretofore—an improvement which adds nothing to your cost. Sunbeam brackets are packed one set to a cardboard box, plainly labeled as to kind and style, with complete list of cars which the enclosed brackets will fit. These cartons can be stocked as "shelf hardware" and make it easy to select the right brackets for any car.



however, are packed separately in cardboard boxes.

This is the Visor that is backed by a real cooperative sales plan. Write for details of liberal dealer proposition. The Sunbeam Junior for open or closed Fords is shipped as heretofore in corrugated paper cartons. The brackets



Handsome Sunbeam Visor display stand loaned to Star Account dealer on \$1.50 deposit,

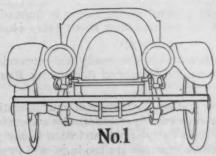
Manufactured By HOMAGSON-INC

Everything in

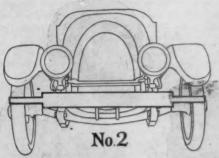
Glass for the Automobile

Iowa

# Sell Them 100% Protection



50% Protection



75% Protection

THE value of a bumper is based largely on the amount of protection it gives.

That is why the Stewart Double-bar Bumper offers the greatest value for the purchaser's money.

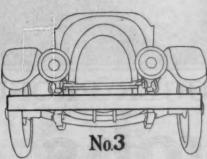
A bumper designed like No. 1 (on the left) does not prevent a bumper on another car from sliding over and damaging fenders.

The No. 2 design protects the radiator but only partially protects the fenders, as does No. 1.

The No. 3 design gives a wide area protecting surface across the entire front of the car, making it impossible for a bumper on another car to damage fenders, headlights or radiator.

These are things to consider when choosing your 1923 Bumper line.

Stewart-Warner Speedometer Corporation CHICAGO, U. S. A.



100% Protection



Model 175-\$22

Gives 100% protection.



The Stewart name-plate may be removed and a car name inserted in its place. These car name-plates are furnished free of charge by any authorized Stewart Service Station.



PRODUCTS
USED ON 8 MILLION CARS

02/x//+/00

## "We'll never 'kid' ourselves again"

That's the most profitable resolution any garageman or car dealer can make.

For when it comes to such questions as how much your sales cost; what are your actual gross and net profits; where are you making money and where losing it—"kidding" yourself is mighty expensive, and usually disastrous.

There is only one sure way to avoid it—by having in front of you every day the figures that tell the real facts about every phase of your business.

The problem of getting these figure-facts easily and economically has been solved by the Burroughs Simplified Accounting Plan for garages and dealers.

The Burroughs Plan gives you a daily picture of your operations. It provides you with complete records of purchases, sales and costs, by departments or lines; tells you what you owe and what is due you; warns you just when and where expenses are too high, and in other ways makes possible complete intelligent control of the business.



## BETTER FIGURES for BIGGER PROFITS

# Burroughs

ADDING - BOOKKEEPING - BILLING - CALCULATING MACHINES

The Burroughs Simplified Accounting Plan has other important advantages, too. It gives you a proven daily balance on every account. There's no month-end rush to close the books. Statements get out on the first, and mistakes in figuring totals are done away with.

At income tax time, making out your report is just a matter of copying figures already in hand.

Anyone who can read can operate this Burroughs Simplified Accounting Plan, and, in the average business, it takes only a few hours each day. Burroughs Adding Machine Co., 6010 Second Blvd., Detroit, Mich.

Please send me more information about the Buroughs Simplified Accounting Plan for garages.

Garage Car Dealer Accessories Store

Address

# OTOR AGE

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MALLERS BUILDING 59 East Madison Street, CHICAGO, ILLINOIS, U. S. A.

Vol. XLIII

Chicago, Jan. 4, 1923

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# FREE AUTO EXHIBIT

## GREER BUILDING

Adjoining Coliseum

## Chicago Auto Show

Jan. 27 to Feb. 3, 23



Coliscum-1443-1513 South Wabash Avenue

## Choice Ground Floor Space to Rent

Read What Our Largest Exhibitor Says:

THE F. A. AMES COMPANY
INCORPORATED
Manufacturers of
Pleasure Vehicles Owensboro, Ky.

December 16th, 1922.

December 16th, 1922.
Greer College of Automotive Engineering,
2024-26 S. Wabash Avenue,
Chicago, Illinois.
Gentlemen: Attention Mr. C. P. Warner, Mgr.

In confirmation of the verbal arrangement made with you on my way through Chicago, this is your order for reservation of spaces Six and Seven, being the same in which we displayed our line of Ames-built bodies for the Ford chassis at the automobile show last January.

Our experience has demonstrated that the Greer Building, located as it is between the Coliseum and Armory, is a much better and more desirable one for our purpose than in the automobile show itself.

We estimated an attendance averaging about 1200 a day, and because there was no charge made for admission we observed that many returned two or three times, resulting in a most satisfactory number of sales.

Your manner of taking care of exhibitors in the Greer Building was most satisfactory in every respect, and we are looking forward with considerable pleasure to being with you again this year.

Very truly yours,

VCP. DWS

Very truly yours,
THE F. A. AMES COMPANY.
V. C. PAGE,
General Sales Manager.

30,000 Automotive Dealers-300,000 Automobile Owners and prospective owners, it is estimated, visit the Chicago Auto Show each year.

There are 6720 different concerns in the Automotive Trades in in Chicago alone.

#### Chicago Auto Show

will be held as usual in the Coliseum, Coliseum Annex and First Regiment Armory at 16th Street and Michigan Ave., one block South. Leaving the Coliseum by the Rear Exit, visitors are admitted free to both Armory and Greer Building.

## The Greer Building

a high, white tile front, one story building 50x165 feet, 30 foot ceiling, three large skylights and beautiful glazed brick walls and ful glazed brick walls and concrete floor, with large, high, wide rear door, built especially for the Auto Trades. Beautifully decorated, brilliantly illuminated inside. Two 500 watt lights over sidewalk.

Price of space, \$50 and up. They are going fast. Reserve yours at once. Floor plan by return mail.

## GREER COLLEGE OF AUTO ENGINEERING

C. P. WARNER, Manager

NOTE: MR. WARNER will be at The Pennsylvania Hotel during the New York Auto Show.

2020 South Wabash Avenue :-: Telephone Calumet 4660-2657 Chicago, Ill.



(A FABLE)

NCE there was a Bimbo who believed everything he read. He saw nothing Fishy about the Trick Timer guaranteeing "25% Gas Saving", the fancy Carburetor Device "cutting Fuel Consumption in half", and the clever Intake Affair "doubling Gas Mileage".

Our Hero installed the whole Works on his Flivver—the thrifty Timer, the shrewd Device, and the canny Affair. Results were gratifying.

His Gas Consumption dropped to less than nothing. His car Gained Gas every mile. Several times on every Trip he had to stop and Bail Out the Surplus Fuel.

Finally in Disgust, he took all the Junk off, threw it at the neighbors' Pets, and installed a Milwaukee Timer to bring his Ford back to Normalcy.

Today, when he reads the Exaggerated Claims of Bush-League Manufacturers, he has a Swell Laugh for himself—and continues to buy Standard Goods, made, advertised, and sold by Responsible People.

Moral: Only Little Fellas can afford to spill Bunk in Ads. They have no Rep to lose.

Milwaukee Motor Products, Inc., Milwaukee, Wis.

Milwaukee Timer advertising, in The Saturday Evening Post and the better farm papers, is sanely and persistently training the Ford owner to realize that the Milwaukee Timer does improve his car, and and is the best two-dollars' worth he can buy for it.

This steady force has a cash value to you, the Dealer. It makes Milwaukee sales easy, quick and therefore highly profitable.

Display Milwaukee Timers
—and they will make real
money for you.

MILWAUKEE
TIMER for FORDS

Sells Fast at \$2.00





# Publisher's Service Station

Rendering Service to Help You Render Service



## Another Show Number Coming

Although this number of MOTOR AGE is devoted almost exclusively to the National Show in New York, January 6 to 13, we want to assure our readers that it is a forerunner of a still larger number coming soon.

On January 25 we shall publish The Annual Show Issue and Specification Number. Our Editorial Department is now working on this number at top speed and we are making considerable effort that it may deserve to take its place in the great feature numbers of MOTOR AGE. Here is a brief outline of the number for you:

There will be an advance story of the Chicago Show.

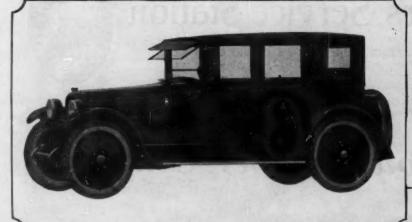
There will be specifications, of course. These naturally will follow the line of specifications of previous years. In them, you will find the exact compilation of the construction of the 1923 cars, trucks, tractors, farm lighting plants, as well as the latest registration data and other statistical information that you will need for reference throughout the year.

Under the general title of AUTOMOTIVE DEVELOPMENT FROM THE MAINTENANCE VIEWPOINT, many topics will be discussed. These articles review how these developments affect the maintenance of the vehicle. We believe that the practical maintenance men of the country will be greatly surprised to learn of the advancements that have been made during the past year. Some of these topics can be told here:

Making the Common Maintenance Operations Easier Maintenance Facilitated by Production Accuracy Manufacturer's Co-operation on Maintenance Longer Engine Life by Proper Lubrication Improvements in Electrical Systems Refinements in Design Bring More Profit The 1923 Car from the Coachbuilder's Viewpoint

Yet these are only a few of the topics that will be included in this annual review. The new stories, of course, cannot be forecasted at this time, but we are sure that it will be of exceptional interest and profit.

## ANNOUNCING



The New Nash"Six" Four-Door Coupe

The New Nash "Four" Sport Model



Together with the announcement of a complete new line of Fours and Sixes, Nash also introduces at the Motor Show two new and exceptionally attractive models—the "Six" Four-Door Coupe and the "Four" Sport Car—that are bound to increase substantially the value of the Nash franchise.

# NASH

THE NASH MOTORS COMPANY

KENOSHA, WISCONSIN

Nash Leads the World in Motor Car Value

## IF you were a Marmon Dealer—

-not only would you receive a profit of Fine Car dimensions, but you would pay very little of it back in the form of service, as maintenance costs on the current Marmon are lower, mile per mile, than those of any other car in its class.

You would sell a car whose upkeep economy has been proved by a nationwide investigation, demonstrating beyond dispute that the running cost of a Marmon over a period of time is a greater saving than the lower first cost of a lesser car—at the same time providing the luxurious riding, impressive dignity and striking

beauty of the Fine Car: advantages craved by every motorist.

You would have the personal aid of a factory Sales Extension Division, maintained exclusively to assist Marmon dealers in every problem of selling, organization, service, advertising, territorial analysis, accounting, and so on.

You would have the same contract, the same car, the same wide market and the same opportunities that have brought security and prosperity to other Marmon dealers whose experiences are related in the Marmon booklet, "Proof Of Profits" — a history of success that will prove an inspiration to every dealer who reads it.

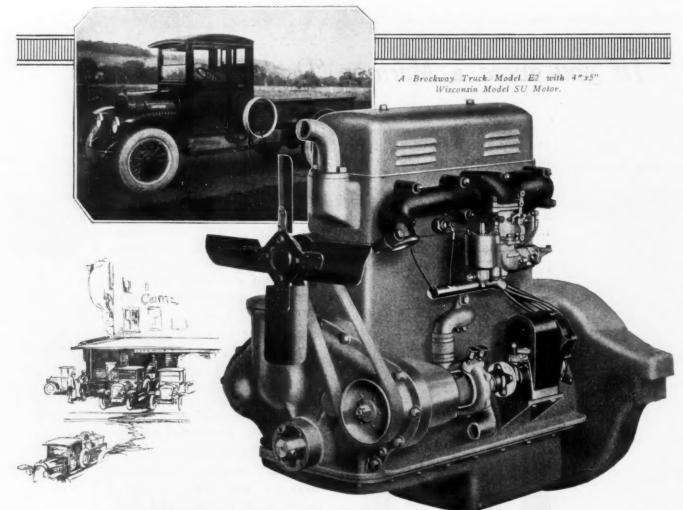
A copy will be mailed free on request. Write for it today.



NORDYKE & MARMON COMPANY Address Inquiries to Dept. A INDIANAPOLIS

## MARMON The Foremost Fine Car

Established 1851



## "That's a Clean Job!"

Offices in New York,

Cleveland, Chicago,

Los Angeles, Seattle.

When you pull up the hood and show a "prospect" this cleancut, compact, Wisconsin motor, he'll like its looks.

But you don't have to stop there. IT PERFORMS. More horsepower per pound than anything else on the market —overhead valves that give it the sort of smooth getaway and quick, easy going, power that wins enthusiasm—a quiet flow of power that carries capacity loads with good nature.

The order getting talking points are all there—and for your information the service is as good as the job itself.

The motor shown above is the "SU" 4" x 5" overhead valves, thirty horsepower at 1000 R.P.M.—fifty at 2000 R.P.M.

Like all Wisconsin Motors, it's proving itself dependable under the hoods of America's best trucks, tractors and passenger cars.

WISCONSIN MOTOR MFG. CO. MILWAUKEE, WISCONSIN



# MOTORAGE



N. A. C. C. committee in charge of the 1923 shows. Top row, left to right: H. M. Jewett, Chairman; Alfred Reeves, General Manager of the N. A. C. C.; S. A. Miles, Manager of Shows. Lower row, left to right: J. Walter Drake; F. C. Chandler; Charles Clifton, President of the N. A. C. C.

## The 1923 Show Season Will Open Saturday

Grand Central Palace to House Brilliant Display of Vehicles

By C. G. SINSABAUGH

News Editor Class Journal Co.

New York, Jan. 2

THE doors of Grand Central Palace are ready to swing open and disclose the wonders of the twenty-third annual show of the National Automobile Chamber of Commerce. While not so numerically strong perhaps as some of its predecessors, this national exhibition, which begins Saturday and runs until the following Saturday night, is perhaps the finest display of American-

built motor cars ever staged, comprising as it does exhibits of eighty passenger cars and more than 300 equipment manufacturers.

Grand Central Palace never looked more in keeping with its name than it does for this approaching show. The plan of decoration as schemed by M. A. Singer is accomplished by boxing in each of the square columns with velvet of American Beauty rose shade in gold frames.

The columns in turn are joined, each to the one adjoining by valances of velvet edged with gold braid. All the windows on the main floor are similarly treated, with the addition of French curtains. Each valance is surmounted by a specially designed ornament.

Mirror chandeliers, glittering with hundreds of electric lights, are suspended in the center court and the idea of palatial grandeur is carried out in the inner main entrance by a great French window backed by mirrors. The great urns that surmount the corners of the balconies around the court are treated with floral decorations to give added richness to the whole. The names of the exhibitors are in raised white letters on red panel with gold borders.

Blue, set off by foliage and flowers, is the color scheme for the second and fourth floors and green is utilized for the third floor.

There will be few new faces in the picture Saturday, in fact there are fewer recruits this year than for some years back—Star, Gray, Climber and American. Of this lot, Star is the only one born in 1922, the Durant "baby." Gray was exhibited last year but not at the show proper, being displayed in the lobby of the Commodore Hotel.

American is not new to the industry but comes back into the show, under the guidance of Carl H. Page, after a year's absence.

The absentees are more numerous, including Stevens-Duryea, Goodspeed, Dupont, Holmes, Jackson, Kelsey, Dixie Flyer, Kline, Leach, Saxon, Standard, Templar, Fergus, Hanson, Itala and Vauxhall, the last two named being cars of foreign make. These concerns are out of the show for one reason and another and their withdrawal explains the total count dropping from 92 to 80.

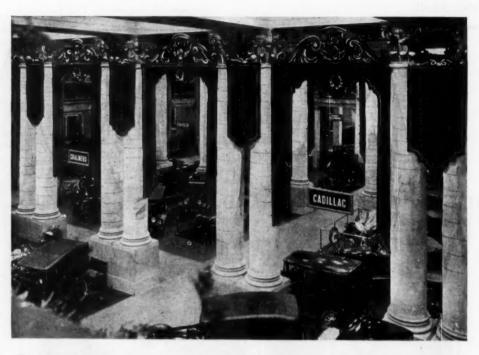
Most of the manufacturers come to the show with models announced in the late fall, but there are several who have waited for the Palace to open before telling the world the new stuff they have been working on for some time and which has been saved for the surprise party. For instance, Stutz has waited until now to spring its six cylinder model, which has been developed quietly. It is Stutz' plan to make both fours and sixes.

John N. Willys is coming to the show with a new line of bodies for both the Overland and the Willys-Knight, none of which have been shown before. Mitchell has a new de luxe phaeton and a new seven-passenger open job, while the radiator shell has been changed in appearance and a new Mitchell emblem adopted.

For the first time Stephens of Moline is showing two chassis, one of 117 and the other 124 inches. Many mechanical changes have been made and the line of bodies is completely new.

Of course Sam Miles, personal manager of the show, figures on a record-breaking attendance. He always does, and up to now he has never been disappointed. It is felt that the public is keyed up to a high pitch and that the Palace will be packed at all sessions. It is thought that this time the people will come to inspect the new models rather than to look for new price tags.

The public's interest, too, will be increased by the "fact contest" which is offered in the nature of a competition designed to find out show values. The simplicity of the plan for recording these votes makes it probable that 90 per cent of the spectators will take part. It will be recalled that at the last show the walls and pillars of the Palace were utilized to display placards on each of which was printed a fact relat-



The decorations of the 23rd annual New York show are said to rival any past effort. Thousands of yards of American Beauty Rose velvet have been used for hanging. The accompanying photograph of a former show has been retouched to give the readers an idea of how these decorations will look to him when he walks into the main court of the Grand Central Palace Saturday evening, June 6

ing to the magnitude, growth, economic value and other facts concerning the motor car industry. For the "fact contest" the same type placard setting forth similar facts, probably 75 or 100 in all, will be used. Each one will be numbered.

As an entrant the sole requirement will be that the visitor select a fact which he or she considers of greatest importance and write a brief comment or opinion.

As usual, there will be outside attractions in the shape of exhibits by manufacturers who are unable to get space in the Palace. Big hotels like the Commodore, Astor and the Ritz will house some of these, while in the Madison Square Garden, formerly the home of the national shows, William H. Wellman will conduct an overflow show which gives promise of being out of the ordinary. Wellman claims all his main floor space has been taken and announces displays by Sunbeam, Kelsey, Puegot,, Mercedes, Driggs, Sanford truck and others, as well as displays by a number of equipment makers.

The schedule of show week activities is a lengthy one this time, including more dinners, luncheons and meetings than in previous years. The week will be featured by the usual four major banquets—the Rubber Association dinner at the Waldorf on Monday night, the National Automobile Chamber of Commerce on Tuesday at the Commodore, the Motor and Accessory Manufacturers at the Commodore on Wednesday and the Society of Automotive Engineers at the Pennsylvania on Thursday

In the way of business sessions there will be the annual meeting of the S. A. E., lasting from the 9th to the 12th; the annual meeting of the Motor and Accessory Manufacturers' Association and the monthly meeting of the directors of the N. A. C. C. on Jan. 10. An added feature will be the special meeting of the truck members of the National Automobile Chamber of Commerce, set for Thursday, at which prominent speakers will discuss the problems of this branch of the industry and endeavor to solve them.

Opening Monday night, Jan. 8, the annual show of the Automobile Body Builders' Association at the 12th Regiment Armory will be an attraction that few of the manufacturers will be able to resist, especially because of the great vogue the enclosed body is enjoying at the present time. This show will close on the 13th.

## Car and Equipment Manufacturers Exhibiting at National Shows

The 80 Car Manufacturers Listed Below Will Exhibit at the New York and Chicago Shows as Indicated in the Columns at the Right

Name	Make	N.Y.	Chl.	Name Make		Chi.
American Motors Corp. of N. J.,				Lafayette Motors Corp., Indianapolis Lafayette	X	X.
Plainfield, N. J.	American	x	x	Lexington Motor Co., Connersville Lexington	×	x
Anderson Motor Co., Rock Hill, S. C.	Anderson	x	x	Liberty Motor Car Co., Detroit Liberty	x	X
Apperson Bros. Automobile Co.,				Lincoln Motor Co., Detroit Lincoln	X	X
Kokomo, Ind.	Apperson	X	x	Locomobile Co., Bridgeport, Conn. Locomobile	X	X.
Auburn Automobile Co., Auburn, Ind.	Auburn	X	X	McFarlan Motor Corp., Connersville, Ind. McFarlan	X	x
	Roamer and			Maxwell Motors Corp., Detroit Maxwell	x	x
Barley Motor Car Co., Kalamazoo, Mich.	Barley	**	x	Mercer Motors Co., Trenton, N. J. Mercer	x	X
Bournonville Rotary Valve Motor Co.,	Dailey	x		Milburn Wagon Co., Toledo, Ohio Milburn Elec.		X
	Dotona Ciw	900	90	Mitchell Motors Co., Inc., Racine, Wis. Mitchell	x	X
Hoboken, N. J.	Rotary Six	x	X	Moon Motor Car Co., St. Louis Moon	X	X
Buick Motor Co., Flint, Mich.	Buick	x		Nash Motors Co., Kenosha, Wis. Nash	X	X
Cadillac Motor Car Co., Detroit	Cadillac	x	x	National Motor Car & Vehicle Corp.,	A	
J. I. Case T. M. Co., Racine, Wis.	Case	X	X	Indianapolis National	-	-
Chalmers Motor Car Co., Detroit	Chalmers	x	x		x	X
Chandler Motor Car Co., Cleveland	Chandler	x	x	Noma Motors of N. Y., 155 Ave. D,		
Chevrolet Motor Co., Detroit	Chevrolet	x	X	N. Y. C. Noma	X	
Cleveland Motor Corp., Little Rock, Ark.	Cleveland	x	x	Nordyke & Marmon Co., Indianapolis Marmon	X	X
Cole Motor Car Co., Indianapolis	Climber	~	x	Oakland Motor Car Co., Pontiac, Mich. Oakland	X.	X
Columbia Motors Co., Detroit	Cole	x	x	Olds Motor Works, Lansing, Mich. Oldsmobile	X	X
Cortland Cart & Carriage Co.,	Columbia	x	x	Packard Motor Car Co., Detroit Packard	x	Ж.
Sidney N V	Hatfield	x	x ·	Paige-Detroit Motor Car Co., Detroit Paig & Jewett	X	X
Sidney, N. Y. Courier Motors Co., Sandusky, Ohio	Courier	x	x	W. A. Paterson Co., Flint, Mich. Paterson	x	X
Crawford Automobile Co.	Courier	ж.	ж.	Peerless Motor Car Co., Cleveland Peerless	X	X
Crawford Automobile Co.,	Chamband			Pierce-Arrow Motor Car Co	-	-
Hagerstown, Md.	Crawford	x	X	Buffalo, N. Y. Pierce-Arrow	×	x
G. W. Davis M. C. Co., Richmond, Ind.	Dagmor Davi	8 X	X	Pilot Motor Car Co., Richmond, Ind. Pilot	x	x
Detroit Electric Car Co., Detroit	Det. Elec.		x	Premier Motor Corp., Indianapolis Premier	X	
Dodge Brothers Co., Detroit	Dodge Bros.	X	×	Rauch & Lang, Inc., Chicopee Falls Rauch-Lang	x	×
Dorris Motor Car Co., St. Louis	Dorris	x	x	Reo Motor Car Co., Lansing, Mich. Reo	x	x
Dort Motor Car Co., Flint, Mich.	Dort	x	x	Rickenbacker Motor Co., Detroit Rickenbacker		x
Durant Motor Company of N. Y., Inc.	2000	-	-	Root & Van Dervoort Engineering Co.,	A	A
Long Island City, N. Y.	Durant	×	x	E. Moline, Ill. R. & V. Knigh	4 20	90
	Earl				IL A	X
Earl Motors, Inc., Jackson, Mich.		x	x			x
Elgin Motor Car Corp., Argo, Ill.	Elgin	×	x	Stanley Motor Carriage Co.,		
Elkhart Motor Car Co., Elkhart, Ind.	Elcar	x	x	Newton, Mass. Stanley	X	X
Essex Motors, Detroit	Essex	x	20	Star Motors, Inc., New York City Star	x	X
H. H. Franklin Mfg. Co., Syracuse, N. Y.	Franklin	x	x	F. B. Stearns Co., Cleveland, Ohio Stearns	×	x
Gardner Motor Co., Inc., St. Louis	Gardner	X	×	Stephens Motor Car Co., Inc.		
Gray Motor Corp., Detroit	Gray	x	x	Moline, Ill. Stephens	x	X
H. C. S. Motor Car Co., Indianapolis	H. C. S.	x	X	Studebaker Corp., So. Bend, Ind. Studebaker	x	X
Handley Motors, Inc., Kalamazoo, Mich.	Handley-Kni'	t. x	x	Stutz Motor Car Co. of Am., Inc.,		
Haynes Automobile Co., Kokomo, Ind.	Haynes	x	x	Indianapolis Stutz	X	X
Hudson Motor Car Co., Detroit	Hudson	x	x	Velie Motors Corp., Moline, Ill. Velie	x	X
Hupp Motor Car Corp., Detroit	Hupmobile	x	x	Westcott Motor Car Co., Springfield. Ohio Westcott	x	×
Jordan Motor Car Co., Inc., Cleveland	Jordan	x	X	C. H. Wills & Co., Marysville, Mich. Wills-StClair		X
King Motor Car Co., Detroit	King	x	X	Willys-Overland, Inc., Toledo, Ohio Willys-Knigh		X
Kissel Motor Car Co., Hartford, Wis.	Kissel	x	x	Yellow Cab Mfg. Co., Chicago Ambassador	X	x
action and the Con and thord, we to		-		Ambassador	a.	A

#### Over 300 Equipment Manufacturers Will Exhibit at the New York and Chicago Shows as Indicated

Alexander Mirrorscope Co., Inc., Rochester, N. Y. x Ca	ar Automotive Parts, Detroit.	200
	arr Fastener Co.,	х
	Cambridge, Mass, x	
		-
	G. Spring Co., Kalamazoo, Mich. x	ж
New Rochelle, N. Y. x Barnes Foundry Co., Inc.,	Buffalo, N. Y. x	X.
Aluminum Die-Casting Corp., New York.	hampion Mfg. Co., Chicago.	X.
Corwood N T Barnes, Wallace Co., Bristol, Conn. X	hampion Pneumatic Machinery	
American Auto Lemp Co. Bassick Mig. Co., Unicago, X X	Co., Chicago. x	X
	hampion Products Mfg. Co.,	
New York.	Newark, N. J. x	
American Automatic Devices Co., Beans Spring Co., Massillon, Ohio. x	hicago Tool & Kit Mfg. Co.,	
Chicago. x Becker Bros., Inc., Chicago x x	Chicago.	x
American Bronze Corp., Beeks Motor Products, Inc., Cl	lark Equip. Co., Buchanan, Mich. x	x
Berwyn, Pa. x x Exeter Boro, Pa. x Cl	lark-Turner Piston Co.,	-
American Chain Co., Inc., Bell Safety Bumper Co., Inc.,	Los Angeles. x	X
	leveland Pneumatic Tool Co.,	440
American Chemical Paint Co., Beneke & Kropf Mfg. Co., Chicago, x x	Cleveland.	x
	ontinental Motors Corp.	A
American Federal Wheel Co., Berg Auto Trunk & Specialties Co.,		-
		X
	ord Tire Corp., Chester. W. Va.	X
	oulter Mfg. Co., Inc.,	
New York. x Bethlehem, Pa. x x	Buffalo, N. Y.	x
	ourtesy Service & Sales Co.,	
New York. x   Blueblaze Motor Specialties Corp.,	Chicago.	x
Apex Electric Mfg. Co., New York, x 2 Long Island City, N. Y. x Co	overt Gear Co., Inc.,	
Apollo Magneto Corp., Borg & Beck Co., Chicago.	Lockport, N. Y. x	
Kingston, N. Y. x x Bowen Products Corp., C.	. Cowles & Co., New Haven, Conn. x	X
Arkay Sales Co., New York. x Auburn, N. Y. x x Co	ox Brass Mfg. Co., Albany, N. Y. x	X
Arrow-Grip Mig. Co., Inc., Boyle Valve Co., Chicago.	uno Engineering Corp.,	
Glens Falls, N. Y. x x Brewer-Titchener Corp.,	Meriden, Conn. x	
Art Metal Works, Inc., Newark, Cortland, N. Y. x x Co	urtiss Pneumatic Machinery Co.,	
N. J. X Bridgeport Coach Lace Co.,	St. Louis.	X.
Asch & Co., Inc., New York. x x Bridgeport, Conn. x Da	alton & Balch, Chicago. x	X.
Austin-Brandmiser Corp., Britton Auto Products Co., Inc., R.	talph E. DeCastro, New York. x	
New York. x New York. x x B.	G. Desmond Mfg. Corp.,	
Auto Bed Camp Mfg. Co., Brown-Lipe-Gear Co.,	Long Island City, N. Y. x	
	. J. Detlaff Co., Detroit.	x
	Petroit Motor Casting Co., Detroit. x	X
	ickerson Auto Appliance Co.,	-
Auto Metal Products Co., Inc., Edw. G. Budd Mfg. Co.,	Warrenton, Va. x	x
	oickinson & Co., Inc.	
Auto Pedal Pad Co., Inc., Budd Wheel Co., Philadelphia, x x	Minneapolis, x	x
	isco Electrical Mfg. Co., Detroit.	x
	poehler Die-Casting Co., Detroit.	A.
St. Joseph, Mich. x x Bullard Machine Tool Co.,		-
	Brooklyn, N. Y. X Cominion Asbestos & Rubber Corp	x
	New York. x	
Automotive Gear Works, Byrne, Kingston & Co., D. Kokomo, Ind.	Soughty Mfg. Co., Inc., New York, x	x
Atlanta, Ga. x Kokomo, Ind. x x D.	oughty Mig. Co., Inc., New York, X	
Automotive Parts Mfg. Co., Cameron Mfg. & Sales Corp., C.	. A. Dunham, Chicago.	X
New York.	Brooklyn, N. Y. x	

N.Y. Chi.

	N.Y.	Cbi.			Chi.		N.Y.
Eagle-Ottawa Leather Co., Grand Haven, Mich.	X	x	J. C. McAdams Co., New York. S. S. McClelland Co., New York.	X	X	Shults Automotive Corp., New York City.	x
Eberhard Mfg. Co.,	20	v	McCord Mfg. Co., Inc., Detroit, Mich.	x		Simmons Mfg. Co., Cleveland.	X
Cleveland, Ohio. Eclipse Machine Co., Elmira, N. Y	. X	X	McQuay-Norris Mfg. Co., St. Louis.	x	x	Simplex Corp., Chicago. Simplex Wind Shield Wing Co.,	X
Ensign Carbureter Co., Chicago. Evans & Ould, New York.	X	X	Majestic Sales Agency, Chicago. Macbeth Evans Glass Co.,		X	Chicago. Simplicity Engine & Mfg. Co.,	X
Everyday Piston Ring Co., E. Rochester, N. Y.	X		Manley Mfg. Co., York, Pa.	X	x	Port Washington, Wis.	X
Fan Flame Spark Plug Co.,			Manufacturers Foundry Co., Waterbury, Conn.			Simpson-Simplex Rim Adjuster F. L. Smithe Machine Co., Inc.,	
Yonkers, N. Y.	X		Robt. Marcus Co., New York.	x		New York. Spiro Mfg. Co. C., New York.	X
Wm. M. Farans, New York. J. H. Faw Co., New York.	X		Marko Storage Battery Co., Brooklyn,	x		Staff Bros. Co., New York.	X
Fitzgerald Mfg. Co., Torrington, Conn.	x	x	Medina Mfg. Co., Medina, Ohio,	x	x	S. S. Stafford, Inc., New York City.	x
Flash Sales Corp., Chicago.		x	Menger Mfg. Co., New York. Merchant & Evans Co.,	X		Standard Auto Parts Co. of Am., Newark, N. J.	x
Folberth Auto Specialties Co., Cleveland.	×	X	Philadelphia.	X	X	Standard Non Skid Grip Co.,	
Foster Machine Co., Elkhart, Ind Franklin Die-Casting Corp.,	l. x	X	Metal Stamping Co., Long Island City, N. Y.	x	x	Metuchen, N. J. Standard Textile Products Co.,	X
Syracuse, N. Y.	X.		Michigan State Auto School, Detroit.		x	New York City.	
Fulton Co., Knoxville, Tenn.	X	x	Midwest Engine Corp., Indianapolis, Ind.	X.	x	Standard Utilities Co., Allentown, Pa.	x
Gabriel Mfg. Co., Cleveland Gasco Mfg. Co., Lancaster, Pa. Gearo Mfg. Co., Quincy, Ill.	X	x	Milburn Puncture Proof Tube Co. Chicago.			Stemco Engineering Co.,	x
General Automotive Corp., Unicag	OX	x	Miles Piston Ring Sales Co.,		X	Dayton, Ohio. Stewart-Warner Speedometer	^
General Electric Co., Schenectady, N. Y.	x	x	New York. Miles Piston Ring Sales Co.,	X		Corp., Chicago.	X
General Safety Signal Co., Newark, N. J.	x		New York City.	v	X	Steyn, Pease Co., New York. Stokes Carbureter Co., Inc.,	X.
L. H. Gilmer Co., Tacony, Pa. Gits Bros. Mfg. Co., Chicago.	x	x	Miller Auto Supply Co., New York. Millers Falls Co., New York. Mirrollika Mfg. Co. Inc.	X		Hampton Bays, L. I.	X.
Globe Machine & Stamping Co., Cleveland.	21		Mirrolike Mfg. Co., Inc., Long Island City, N. Y.	X		Stouts Wheel Sales Co., Stromberg Motor Devices Co.,	
Globe Mfg. Co., Battle Creek, Mic Greenfield Tap & Die Corp.,	ch.	x	Moto-Meter Co., Inc., Long Island City, N. Y.	x	X	Chicago. Sun Co., Philadelphia, Pa.	x
Greenfield Tap & Die Corp., Greenfield, Mass.	x		Motor Car Supplies Co., Inc., New York.	x		Superior Lamp Mfg. Co., Inc., New York.	x
C. M. Hall Lamp Co., Kenosha, W	is.	x	Motor Wheel Corp., Lansing, Mich.		v	Swartz Mfg. Co., Freeport, Ill.	-
J. P. Hallady Co., Decatur, Ill. Edw. V. Hartford, Inc., New York		X	Mullins Body Corp., Salem, Ohio	X	X	Sweet & Doyles Foundry & Ma- chinery Co., Troy, N. Y.	x
Hartford Battery Mfg. Co., Milldale, Conn.	X		Nacto Cleaner Corp., New York. Naperville Machine Co., Inc.,	X		Thompson Spring Co.,	
Hartland Co., Inc., New York. Robt. H. Hassler, Inc.	x		Naperville, Ill.		x	Wilmington, Del. Timken-Detroit Axle Co., Detroit.	X
Indianapolis, Ind.	x	X	National Association of Curled Hair Mfrs., Philadelphia.	X		Tonneau Shield Co., Inc.,	x
Hayes Mfg. Co., Detroit. Hayes Wheel Co., Jackson, Mich	). X	x	National Collapsible Rim Corp.,	X	x	New York. Torsion Test Piston Ring Corp	
Heald Machine Co., Worcester, Mass.			New York. National Marine Lamp Co.,			Newark, N. J. Travers, Chicago.	X
Heinge Electrical Co.,	X	X	Forestville, Conn. National Seal Co., Inc., Brooklyn. New England Fabrics Mfg. Co.,	X	X	Trindi Co., Chicago. Triple Action Spring Co.,	
Lowell, Mass. Heintz Mfg. Co., Philadelphia.	X	x	New Haven, Conn.	X		New York.	X
Hercules Bumper Corp., Detroit. Hercules Motor Mfg. Co.,		X	New Era Spring & Specialties Co. Grand Rapids, Mich.	· x		Triplex Machine Tool Corp., New York City.	x
Canton, Ohio.	X	X	Nolenz, Inc., New York City.	X		Turner Mfg. Co., Kokomo, Ind.	
Hobson Oil Co., Inc., New York. Ernest Holmes Co.,	Х		Norton Co., Worcester, Mass.	X		U. S. Auto Lamp Mfg. Co., New York.	x
Chattanooga, Tenn.	X	x	Oakes Co., Indianapolis, Ind. Pantasote Co., New York.	X	X	U. S. Axle Co., Pottstown, Pa.	x
Geo. L. Holmes, New York. John C. Hoof & Co., Chicago	X	x	Panyard Piston Ring Sales Co.,	X	X	U. S. E. Corp., New York. Union Agencies, Inc., Chicago.	X
Hopkins Mfg. Co., Hanover, Pa. Houdaille Co., Buffalo, N. Y.	X	x	Detroit. Partridge, Singer & Baldwin.	X		United Autoware Co., Inc., New York.	x
Houpert Machine Co., Long Island City, N. Y.		37	New York, Pederson & Flanagan, Inc.,		X	United Metal Spinning Co., Inc.,	
Imperial Brass Mfg. Co., Chicago	X	x	New York. Pennsylvania Piston Ring Co.,	Х		Brooklyn. United States Chain & Forging	X
Inland Products Co., Inc.,			Cleveland, Ohio. Perfection Heater & Mfg. Co.,	X		Co., Pittsburgh, Pa. Universal Tool Co., Garwood, N. J.	X
International Nickel Co.,	X		Cleveland, Ohio.	X	x	Utica Compressor Co., Inc.,	~
New York.	X		Perfection Gear Co., Chicago. Philadelphia Storage Battery Co.	X	Х	Utica, N. Y. Vacuum Oil Co., New York.	X
J. & B. Mfg. Co., 63 Eagle St., Pittsfield, Mass.	x	X	Philadelphia. Philbrin Corp., Kennet Square, Pa	X		Van Norman Machine Tool Co.,	
Jennings Corp., Pittsburgh, Pa. Johnson Auto Lock Co., St. Loui	X	x	Pines Mfg. Co., Chicago, Ill.	X	X	Springfield, Mass. Van Wheel Corp., Oneida, N. Y.	X
C. N. & F. W. Jonas, Chicago.	X	x	Pioneer Motor Bearing Co., Brooklyn.	X		Van Wheel Corp., Oneida, N. Y. Veeder Mfg. Co., Hartford, Conn. Vibration Specialties Co.,	x
K-W Ignition Co., Cleveland. Kant-Rust Products Corp.,	x	x	Wm. E. Pratt Mfg. Co., Chicago. Preferred Utilities Co., Inc.,	X	X	Philadelphia, Volator Co., Chicago.	X
Rahway, N. J.	X		New York. Prest-Air Corp New York City.	X		Waltham Watch Co.,	^
Kant-Skore Piston Co.,		-	W. E. Pruden Hardware Co.,	A		Waltham, Mass.	X
Cincinnati, Ohio L. Kellenberger & Co.,	X	X	New York. Pyrene Mfg. Co., Newark, N. J.	X	x	Warner-Patterson Co., Chicago. John Warren Watson Co.,	X
Geneva, Switzerland. Kellermann Crystal Prod. Co.,		X	Rajah Auto Supply Co.,			Philadelphia. Waukesha Motor Co.,	×
New York. Klaxon Co., Newark, N. J.	X	x	Bloomfield, N. J. Rajo Motor Co., Racine, Wis.	X	X	Waukesha, Wis. Weaver-Ebling Auto Co.,	ж
Kokomo Electrical Co.,			Ramspring Bumper Co., Chicago. Recording Devices Co.,		X	New York	x
Kokomo, Ind. Kraeuter & Co., Inc.,	X	X	Dayton, Ohio.	X	x	Weaver Mfg. Co., Springfield, Ill. Weldo Patch Mfg. Co., New York	. X
Newark, N. J. Kulas-Snyder Mfg. Co.,	×	X	Reus Mfg. Co., Baltimore. Md. Rex Mfg. Co., Connersville, Ind.	X	X	Wel-Ever Piston Ring Co., Toledo, Ohio,	
Cleveland, Ohio.	X	x	Rich Mfg. Corp., New York, Geo. H. Rives Mfg. Co., Inc., Brooklyn, N. Y.	X		Wengraf Mfg. Co., Long Island City, N. Y.	25
E. A. Laboratories, Inc., Laduna Products Corp., New Yor	k x	X	Brooklyn, N. Y. Ryser Machine Works, Chicago.	X	x	Westinghouse Air Spring Co.,	~
La-Lo Chemical Co., Inc., Providence, R. I.			Safstrom Mfg. Co., Chicago.	x	X	Chicago. Weston Electrical Instrument Co.,	X
Landis Tool Co., Waynesboro, P Lane Bros. Co., Poughkeepsie,	a. x	X	Sage Bros., Inc., Brooklyn, N. Y.	X	A	Newark, N. J. Wethent Watching Alarm Corp.,	X
N. Y.	X		Schaap Co., Brooklyn. Wm. H. Schaefer & Bro	X		New York City.	X
Lesher, Whitman & Co.,		x	New York. H. Scherer & Co., Detroit.	X	x	Wheeler-Schebler Carbureter Co., Indianapolis, Ind.	X
New York City. Light Mfg. & Foundry Co.,			Schleider Mfg. Co., 500 Fifth Ave., N. Y. C.	x		Whitney Mfg. Co., Hartford. Conn Whittemore-Sim Co., New York.	X
Pottstown, Pa. Link-Belt Co., Chicago.	×		A. Schrader's Son, Inc., Brooklyn.		x	Wildenberg Bros., New York, K. R. Wilson, Buffalo, N. Y.	X
E. C. Long Piston & Alloy Co., Detroit.	x	X	Scintilla Magneto Co., Inc., New York.	x		Witherbee Storage Battery Co.,	-
Lovejoy Mfg. Co., Boston Lowe Motor Supplies Co.,	X		Sherwood Petroleum Co., Inc.,	-		Inc., New York. F. Wolkow & Sons.	X
New York.	x		Brooklyn. H. B. Shontz Co., Inc.,	X		Louisville, Ky. Wyman-Gordon Co.,	X
Lubricator Mfg. Co., Philadelphi Lyons Mfg. Co., New Haven,	8.	X	New York. Shore Instrument & Mfg. Co	X		Worcester, Mass.	
Conn.	×		Jamaica, L. I.	X		Yellow Jack-It Mfg. Co., Chicago.	

## Making the Automobile Show a Success

Advertising the Show—Presenting it With the "Local" Idea Foremost—Features—Publicity—Presentation

By JAMES V. MALONE

WO things are necessary to the success of the automobile showattendance and sales, principally the latter. This applies in the city of three million as well as in the town of ten thousand and the "problem" of attracting a good attendance and making a number of sales is the same in either case. With 1922 being written into history as the greatest year in the industry, dealers and associations are turning their attention to that avenue to sales called the show. The year 1923 holds forth even greater promise than did 1922, because, figuratively speaking, the stage is set, people are in a buying mood and will buy if asked in the right manner.

This does not mean that the splendid effort which marked every exhibition in the country last year can be passed up; rather, it indicates that even greater effort should be put into the shows for 1923 so that the public can again be assured that the automobile is forging ahead right to its proper place—17,000,000 by 1930.

The "effort" put into an automobile show means the time and money spent in properly presenting it to the public. Last year even the remotest towns came forward with really startling ideas on advertising and presentation. Publicity is another important element in putting the show across. Usually, publicity is regarded as the "free notice" given by newspapers to the exhibit and very often favorable publicity is a big factor in bringing up the attendance.

First let us consider the advertising of the show, using every possible avenue of quick publicity, which includes the following list of most generally used mediums:

The newspaper The bill board The street car The railroad train Letters "Pluggers" Parades

The first meditioned, the newspaper, is, of course, the first thing thought of, and then the question, "What kind of copy and how much money should be spent?" is asked. To answer this would be impossible, as each association running a show must investigate for itself, just how many people the newspaper in which they are to advertise reaches.

The copy of all the dealers participating should feature the show and the date, with their car occupying an equally prominent position. The show's own advertising is another thing. On these pages are reproduced two small ads



A suggestion for a show poster is shown above, depicting briefly the history of transportation as we have known it

which have been effectively used in advertising shows.

This advertising must be localized; that is, in drawing a picture of the use of the automobile, places of local interest should be referred to with the thought that few car owners are going to use their cars for cross-country touring. When the show is in progress, the newspaper can be used as a place where the date and location of the show are given as reminders. It is the newspaper, too, that figures in the publicity and in another part of this article we shall deal with that.

The bill board is, perhaps, as effective as the newspaper, but the show is dependent upon both for its attendance. In bill board advertising, it is necessary to lay out a definite plan so that the advertising will be in keeping with the purpose. By that is meant that money can be saved if it will be remembered that

the time and place are the things which are to be impressed on the public mind.

Very often a successful billboard campaign is conducted when the signs read simply, "Attend the Automobile Show at the Town Hall, March 4 to 11."

The street car and railroad train serve the same purpose as the billboard. Few people reading street car ads have time to read a lot of copy. Just a glance is all they receive and so the shorter the ad, the better. A good plan as worked out in many sections of the country as regards railroad and street car advertising is to secure, where possible, a reduction in rates for people coming from out of town to attend the show.

In connection with this it is well to advertise the reduction in as prominent a place as can be secured. Where the transportation is by electric train, the front window or the outside of the car is a good place to put a poster calling attention to the reduction and the time and place of the event. Billboard advertising on the station platforms is also a paying location. Dealers in Atlanta, Ga., last year and in several other states secured this accommodation from the railroad companies.

Letters can be used in some instances, though it would be hard for the show managers of Chicago and New York and other big cities to circularize all the people, in smaller towns this method should prove a valuable supplement to newspaper and billboard campaigns. "Pluggers" are referred to because they can be printed by the individual dealer or by the association, stressing the time and place always and the attractions at the show

#### Cleveland Show Campaign

The campaign conducted by the Cleveland dealers in the staging of their last show is an especially interesting one. Everything was worked out in detail weeks beforehand and then the story of the show was revealed to the public in a really attractive manner. Every possible means of advertising the event was used and the results are summed up in the words, "The show was a success," which means that cars were sold and everyone participating in the event was well paid for their efforts.

Here are some of the things that the Cleveland dealers did to make their 1921 show their greatest:

1.—It was announced in the newspapers that there would be three orchestras instead of one and that the leaders would be the city's most popular musicians.

This feature of three orchestras, all of them under well known directors, gave the impression that something else had been thought of beside automobiles, and the orchestras were bound to pay their way. Hearing the popular strains at the show brought visions to the prospects of many pleasant evenings at country road houses, which he would be able to enjoy if he owned a car.

2.—Civic organizations were interested to place posters and arrange special dec-



Standards such as this were used by the Cleveland dealers in directing people to the show. Every lamp post in the business district held one, the arrow indicating the way to the show

orations in the store windows of their members, to attach poster stamps to their correspondence and to call attention of out-of-town members to the show. The posters read "Visit the Cleveland Automobile Show, Jan. 19-27" and were placed on the backs of the envelopes. This method of reminding is a good one and never fails to receive attention.

3.—The interurban and suburban railroads and trolley lines were induced to grant half fares to and from the shows on Sunday and to advertise this rate in the newspapers, on car cards and with attention-arresting streamers. 4.—The city was persuaded to permit the use of light standards in the white light districts to carry arrows pointing out the route to the show from every part of the downtown district. Along the street on which the building where the event was taking place was located, every lamp post bore one of these standards.

5.—Two newspaper reader contests were arranged, one a puzzle contest and the other a drivers' examination, the latter stimulating interest in prospective legislation for a drivers' license law in the state. The first contest attracted 5200 entrants and the second 600. The first was carried in the newspaper with a two-column spread news story for two weeks and the second stayed for 10 days. Both got on the front page several times and both were carried there the day before the show opened, announcing the winner.

Contests of a similar kind can be run in connection with any show and they are always sure to land big with the newspapers. These may take the form of a slogan contest, an expression on what the automobile has done for the country, or what the prospect intends to use his car for.

The slogan contest might embody the reasons for people attending the show. The slogans would, of course, have to be very short, limited to perhaps four, five or six words. The prize could be a certain amount of money credit on whatever car the winner decided to purchase. The reason for offering credit would be to insure that the winner bought a car and was from the ranks of those who intended to buy at the show.

Announcement of the contest should be made at least two weeks before the opening of the show and should continue to work up interest until the opening day of the show, when the winner would be announced at a certain time at the show. This would draw all of the con-



Portland, Oregon, dealers at their annual show in March, brought out some new ideas in show advertising, two of which are shown here. The event was featured as a field day of motor transportation and a social event, one which the public would profit by intellectually and economically. That the idea went over big was evidenced by the record-breaking attendance



testants on the opening day and also be the feature for the day.

An expression on what the automobile has done for the country could be carried as a sort of story contest, making plain the fact that literary style would not be considered but that the best reasons for the automobile written in as short a space as possible would receive the prize. The winner of this contest could be announced on the second day of the show.

What the prospect intends to use his car for would also bring out some interesting sales material and the winner announced the third day of the show.

If the prize were to be \$100 on any car the winner should decide to buy, he could pick it out and then the association "square up" with the dealer who got the sale.

6.—The association cooperated with territorial dealers and 25 out-of-town newspapers in conducting special Cleveland show editions, which helped the show and the outside dealers, too. All of this advance activity gained such force that when the show opened, the special editions of the papers were the largest ever published for such an event. This, of course, was due, in part, to the liberality of the distributors' advertising appropriations.

#### An Automobile Show Circuit

In Michigan, dealers banded together in the state trade association have organized a show circuit, modeled after the various theatrical "wheels" where the settings of the show were moved from town to town. The purpose of the circuit is to bring a big town show to the smaller town populace.

Last year this show opened in Pontiac on Jan. 18 and was repeated 11 times in various cities. The combined finances of the dealers of all these towns enabled the show managers to "put on" a really big show in each town. The prospect saw the car in settings to which he was more or less unaccustomed. The general decorative scheme was in black and white.

In 1923 it is planned to add at least nine more towns to the circuit and make the shows better than before. And, under the new plans, duplicate sets of decorations will be supplied so that the same show may be held in different towns at the same time.

A general manager is in active charge of the show and is assisted by publicity and advertising men whose duty it is to see that newspapers are supplied in advance with information of the shows.

Manager W. D. Edenburn, of the State association, says that the show in 1922 was a great success and that its repetition in 1923 on a larger scale is sure to bring results in proportion to the effort put into it.

#### State Fairs

State fairs are often the stage on which the automobile show is set and here the show manager has a different

problem, that of attracting people to the automobile division in particular. In too many cases the automobile men have been content to see their names in the "also exhibiting" column of the newspapers when they might just as well have it said that their part was the really bright spot of the fair. Sometimes no effort is made on the part of the car exhibitors to attract people interested in their wares. They should remember that the man who comes to the state fair to take a ride on the merry-go-round is not likely to think of automobiles unless his attention is called to them.

In some of the larger cities there are events which can be compared to the state fair. Chicago has its Pageant of Progress at which several automobile sales were made. The way people have passed up the automotive exhibit, however, has been pathetic. There has been too much of interest to be seen outside—other industries had made a greater effort to attract and they have succeeded while the automobile men had to be content with just a "few sales."

At the Wisconsin State Fair, at Milwaukee, automobile exhibitors set out to get the farmer interest by a really attractive exhibit of trucks and tractors. The automobile division was called "Truck Town." Each booth represented a house and the aisles were given street names. The idea, while far from original, was novel enough to attract, and people flocked to the exhibit because several oddities of entertainment were promised to those who entered.

An old-timer, a graduate from the buggy days, tells how to exhibit at fairs. He says:

"The vehicles to be exhibited should be of the flashy type. Everybody in the world knows what a somber looking truck or automobile looks like, but a white car, a body of unusual design and color scheme, or otherwise out of the ordinary, always attracts attention. People stop to look, then get interested, and while 99 per cent of them are not prospects for such a car as you exhibit, it has served as an opening to introduce them to a car in keeping with thir own modest taste.

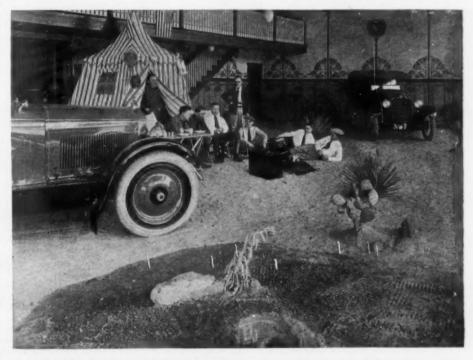
"Then, too, some people are interested in the mechanics of the car. Not many, it is true, but you cannot afford to ignore them. If a stripped chassis is not available, just turn a car over on its side so that people can see what is underneath.

"Never put a car in a fair exhibit that is too nice for people to touch or for people to get into and sit down. The people who go to fairs are just ordinary sort of folk, curious about a good many things but thoroughly practical, and they want to know how things feel as well as how they look. They have come to the fair to be entertained and your car is part of the entertainment. Let it be that and you will profit."

#### Handling a Truck Exhibit

The county fair is the natural place to exhibit a truck and with the chassis there should be an exhibit of as many styles of bodies as the exhibitor can obtain.

After all, the chassis of a truck is the minor factor to the buyer. The body is the thing that makes it applicable to the problem of the man with freight to haul. The purchaser today can assume that any one of many trucks can do his work but he cannot assume that a dump body will be suitable for his purposes if the



Here is an ideal show room setting, bringing to the prospect the joy of the outdoors as he will know it with a motor car

freight he has to haul does not lend itself to dumping.

One truck chassis with several bodies would be an excellent exhibit. The truck prospect is usually a practical man, with very definite ideas of his own work. It is not to his discredit to say that he may lack somewhat in imagination. Dealers who have been successful in selling trucks to farmers and small contractors, have used the body to a very distinct advantage in putting over these sales.

The success of "Truck Town," at the Wisconsin State Fair, is well known. An imposing entrance to the truck exhibits was erected, displaying the name "Truck Town" in regulation fair style, The exhibit spaces were liberal in size and each exhibitor had a temporary building as an office, where special literature was kept and where sales contracts could be signed. More than 60,000 people visited this collective exhibit the first year.

### Soliciting the Aid of Everyone

If the automobile show is to be counted as a success, the exhibitors must make a lasting impression on people. Soliciting the cooperation of other merchants and interesting them to the extent of taking part, is an effective way of getting to every one.

Dealers in lines of business which would be especially benefited by the purchase of automobiles can be solicited with no trouble. Sporting goods dealers would gladly loan fishing tackle, guns, tents and sportsmen's equipment of all kinds to help lay out a forest setting for the display. Builders of portable houses are also likely to be interested, not to

mention clothing and department stores.

Posters and window cards can be used in connection with such displays, placed prominently in view of the public. Dealers belonging to local business men's associations can be especially instrumental in making the show a success, calling, if necessary, a special meeting of the association and asking for aid, promising, of course, reciprocation at any time.

Another avenue to publicity is through social organizations and associations, setting aside special days when these organizations take part in the show.

Each day may be featured with a name; for instance, "Truck Day," "Tractor Day," "Enclosed Car Day," "Touring Car Day," and a special effort made to sell that type of car on that particular day.

Interior decorations have a great deal to do with sales. Most people are more or less affected by "atmosphere" and attempting to present a beautiful car in bare settings would ruin any sale. A review of some of last year's shows reveals that a wide variety of decorative schemes were brought forth in various sections of the country.

#### The Individual Salesroom Show

The Michigan circuit, as stated above, used black and white. This same scheme was carried out in the Chicago Show. At Denver, gold and white with flowers were used. Boston used panelling which imparted the air of an old cathedral. Everything was highly colored and ferns were used extensively. The absence of flowers is especially noticeable and incidentally notable in this case because the degree of color

was high enough and the ferns had a tendency to "tone things down."

Two very good examples of what constitutes a good individual salesroom show are contained in the Chicago Enclosed Car Show and the San Francisco "Call of the Open Road Week." Perhaps the latter was the greater of the two because of the widespread interest it aroused and the attention it attracted.

When the setting for the "Call of the Open Road Week" had been completed, every automobile establishment in San Francisco resembled a nook in some woods. Dealers went out into the nearby forests and gathered the "real stuff" with which to decorate their showrooms and windows. Automobile row was transformed from a busy thoroughfare into a wooded aisle.

Many famous scenes in the Rocky Mountains were reproduced and the event commanded the attention of newspapers. Art critics were generous in their praises of the way the show was staged. Always, the automobile was somewhat in the background and the appeal made to prospects was, "If I had an automobile, I, too, could enjoy this." Hunting, fishing, golfing, bathing and every outdoor sport was depicted in one way or another, the sporting goods dealers furnishing the tents and other equipment.

The Chicago show was quite another kind of affair because, while the San Francisco event heralded the opening of the Spring touring season, the former was an effort to create interest in the enclosed car at the opening of the Winter season. Fall decorations were carried in the Chicago event, gold and brown being the colors featured.

The Stutz Chicago Co.'s window was notable because of its simplicity. The picture in no way depicts the effect obtained by the lights and the silver and gold leaves which are strewn about at the base of the window, making a striking frame for the blue finish of the car.

The Peerless company also presented a beautiful window with the same scheme of brilliant autumn colors, carried in an especially attractive manner. The Peerless company has spent hundreds of dollars on its windows in the past year but, according to the advertising manager, the money has been well spent. The thing to be remembered in the individual sales room show is that a special effort at something big must be made if the newspapers are to be interested.

The problem of features was solved by the Harrisburg, Pa., dealers recently when they ran a beauty contest with their show. The danger here, however, lies in the possibility of the feature attracting more attention than the car, which should be at all times carofully guarded against. There is the connect that a beauty contest would attract a lot of women who were not interested in automobiles.

Perhaps there would be some with conducting the contest so that it would



The Stutz-Chicago Co., during the Enclosed Car Show held in Chicago, presented a prize winning window, which was attractive mainly because of its simplicity. The foreground was of brightly colored autumn leaves and flowers with the lights from overhead immediately demanding the attention of the passerby. The window was arranged by F. D. Cerf, general manager of the Chicago branch

be the background of the show. Each woman entering the contest might be required to register through one of the exhibiting dealers and have a certain time when she would appear at the booth, the contest decided by the greatest number of votes submitted. People voting might be required to leave their names and addresses, which would make a prospect list, but even this method of handling such an affair would be somewhat confusing.

#### Promoting the "Buy-at-Home" Idea

Often the automobile show can be used as a general campaign to promote more "buying at home." Evanston, Ill., a suburb of Chicago, found that a great deal of their business was slipping into the hands of the big city dealers and in an attempt to stop this, put on a show, which was contributed to by merchants in other lines of business. Often dealers in small towns find that a good deal of their accessory and tire business is going to mail order houses and other lines of business have the same trouble.

The reason for this often lies in the fact that the dealer has not given the townspeople a good enough sales talk and the show is the place to break down this barrier of ignorance which holds owners from buying of their local merchants.

Mason City, Ia., not having a big enough place to house a show of the size they wanted to stage, introduced the "Automobile Carnival." The ceiling of their "auditorium" was the blue sky with gay decorations and lights marking the streets where the carnival was held. Street dances and band concerts were the features of this show.

The West Side Dealers' Assn., Chicago, at their show, held in a well known dance hall, secured the services of a vaudeville actor gifted with a remarkable ability to control his facial expression. He was called the man who would not smile and a prize of an automobile was offered to the person who could make him laugh. This novelty attracted many people to the hall.

The Elks' Fashion Show in New Orleans is an annual social event and is participated in by most of the automobile dealers. The receipts are turned over to a hospital and no advertising or selling of cars is allowed. However, the dealers believe that the newspaper publicity helps them in the actual selling later on. The affair is held at the Fair Grounds racetrack and the cars of the entrants are driven by society girls. A prize is given for the best combination of costume and car.

#### The Used Car Show

The Chicago Automobile Trade Association last year held its fifth annual used car exhibition and sold cars. We lie the attendance was limited strictly to those interested in buying a used car at the time, still this added an attractive feature in the fact that "everyone"



The Edwards Crist Co., Auburn distributors in Chicago, dressed their show room in fall colors with a footpath through a "woods." The effect obtained by the use of these decorations was exceptional

was not coming. Confidence has been the foundation of every used car show in Chicago. The people know when they are buying a car that it is the best they can get for the money.

A novelty in the way of merchandising was tried at the 1922 event when a "bull ring" of used car bargains was made in the annex of the Coliseum. Any dealer exhibiting at the show was permitted to put any of his cars that he desired into the ring. One night was \$200 night, the next \$400 night, the next \$600 night, and prospects could select any car in the ring, pay for it and take it home.

Every dealer advertising during the show gave prominent place to show copy in his space and also called attention to the event by mail.

#### Parades and Other Features

Parades are often the opening feature of a show. In many towns and cities the show would not be considered complete without one. In the Chicago Pageant of Progress parade, automobiles stood out attractively and at the San Francisco "Call of the Open Road Week" a continuous line of cars, equipped with all the needs of campers, hunters and fishermen, moved up and down the "row" adding to the lure of the showroom and window displays.

Highly colored floats with bands have helped in these parades. Another means of attracting attention was recently tried at an eastern show where the dealers secured the use of a public square in the downtown district for two weeks preceding the show. A white pedestal was erected and each night a different car was exhibited calling attention to

the show. Lights from nearby buildings played continuously on the cars.

Still another feature that is attractive is a "Days of Buffalo Bill" setting, when everything automotive reverts to the early days when stage coaches were the only means of transportation. An ancient vehicle of this type is exhibited in contrast with the beautiful cars of today. This attraction seldom fails to command a lot of attention.

In many instances this year, show managers have found it profitable to give prizes to people owning the oldest car in their territory, to the person driving the greatest distance to attend the show and to the fattest man driving in to attend, and similar novelty prizes.

The National Association of Automobile Show and Association Managers, at a meeting held in Chicago, at the Congress Hotel, Sept. 14-15, 1922, discussed at some length the problem of the used car. This organization, until recently, devoted its entire effort to automobile shows, but with the growth of the used car problem, turned its time to this department of the business.

Many of the shows reviewed in this article, in fact all of them, are the realization of suggestions made at the meetings of the above organization. Members have been liberal with suggestions and all of them have been in some way practical. The show managers have been active in spreading the gospel of the show and in enabling the show to be carried to the more remote towns.

That 1923 will be even greater than 1922 has been cannot be doubted, but the bounds of its greatness depends, to a large extent, on the effort that YOU and your association put into your annual automobile show.

## Six-Cylinder Car At \$795 Announced By National Motors Corporation

Merger Formerly Known as Associated Motor Industries Brings Out New Line of Nine Models in Three Price Groups

CHICAGO, Dec. 30—At a meeting yesterday of the stockholders of the Associated Motor Industries, at which plans were made to announce at the New York show a six-cylinder car for \$795, it was voted to change the name of this large automotive merger to National Motors Corporation. Hereafter it will be known by the new name.

This is the merger incorporated in Delaware more than a year ago for \$80,000,000, the completion of which was announced last July when eight companies, including the National Motor Car and Vehicle Corporation, the Kentucky Wagon Co., the Traffic Truck Corporation and the Jackson Motors Corporation, were acquired.

It was announced that hereafter all the passenger cars made by the new corporation will go under the name National. Small stocks on hand of Jackson and Dixie Flyer cars will be sold at a sacrifice and these makes will be discontinued, according to T. C. Brandle, vice-president in charge of merchandising.

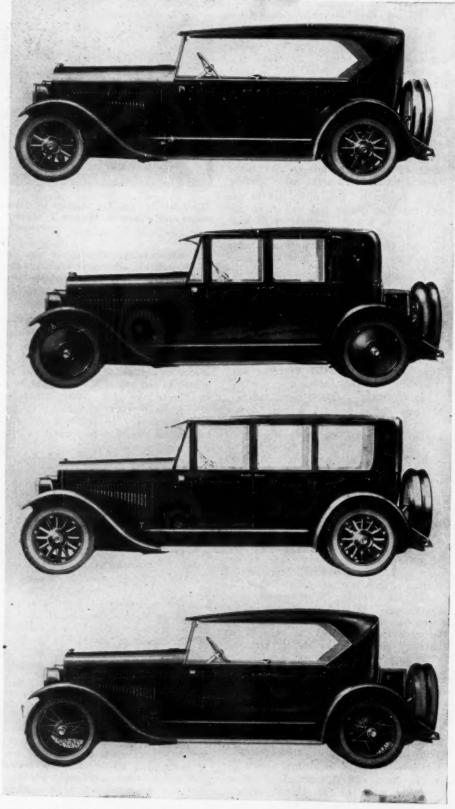
The new line of National cars now ready for announcement includes nine models in three size groups. It was emphasized by Brandle that these are entirely new cars and are in no way related to the old National which was made by the former National Motor Car and Vehicle Corporation.

#### Revolutionary Price

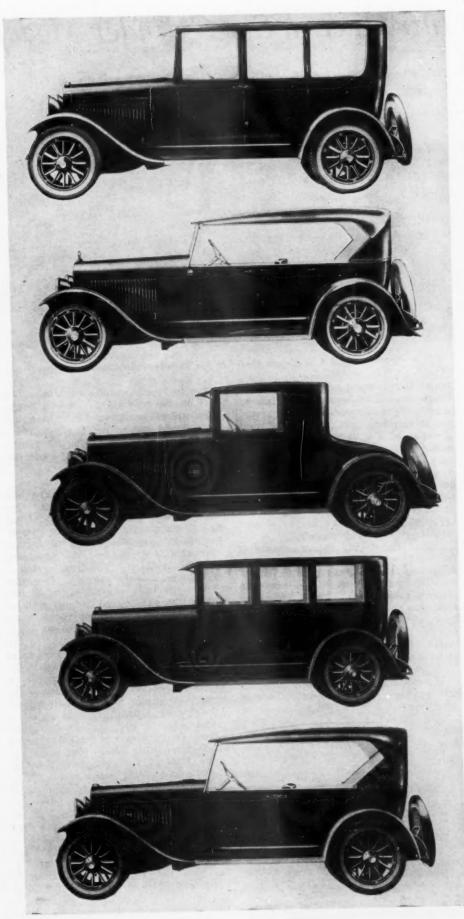
Leading the new line at a revolutionary price is the National six thirty-one to sell at \$795 for the five passenger phaeton. The only other model ready in this group is the sedan which will be priced between ten and eleven hundred dollars. This car is to be powered with a sixcylinder National engine made in the corporation's own plants. Most of the other units will be manufactured by the corporation and the car will be assembled at the Louisville plant of the Kentucky Wagon Co. where formerly the Dixie Flyer was made. It will have 112 inch wheel base. The production schedule for 1923 is 30,000 cars of this type.

The second group is called the six fifty-one and the five passenger touring car sells for \$1485. It is powered with a six-cylinder Continental eight-R engine. The wheel base is 121 inches. It will include a number of standard units not made in the corporation plants. It is announced in three models, the phaeton, sedan and coupe. This car is to be assembled at the plant of the Jackson Motors Corporation, Jackson, Mich. The production schedule for 1923 is 7000 cars.

The third line is the six seventy-one,



National 6-71 Models, from the top down: 7 passenger phaeton; 4 passenger close-coupled sedan; 7 passenger sedan; 5 passenger sport phaeton



National Models from the top down: 6-31, 5 passenger sedan; 6-51, 5 passenger phaeton; 6-51, 2 passenger coupe; 6-51, 5 passenger sedan; 6-31 5 passenger phaeton

the seven passenger phaeton to sell at \$2485. This car will have a six-cylinder National engine. The wheel base will be 131 inches. The four models announced are the seven passenger phaeton, five passenger sport, sedan and close coupled sedan. This car is to be produced at the plant of the National Motor Car and Vehicle Corporation at Indianapolis. The production schedule for 1923 is 5000 cars.

The bodies of all these models have been designed by H. F. Holbrook who has been retained by the corporation as its body engineer.

#### Will Also Build Trucks

The corporation also will manufacture the Traffic truck in the St. Louis plant of the Traffic Truck Corporation. A schedule of 13,000 trucks for 1923 has been approved. In addition to directing the merchandising activities of the National Motors Corporation, Brandle will continue as manager of the Traffic truck plant. He was formerly vice-president and general manager of the Traffic corporation.

Will I. Ohmer, formerly president of the Recording and Computing Machine Co., of Dayton, Ohio, continues as chairman of the board of the National corporation. First vice-president is A. A. Gloetzner, formerly president of the Covert Gear Co.

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Brandle will have charge of the corporation's exhibits at the New York show. He announces that in taking charge of the merchandising of the National products he will endeavor to procure representative dealers in every section of the country to handle the entire line for both sales and service. For the present his headquatrers will be at the factory of the Traffic Truck Corp. at St. Louis.

#### THE FARMER COMES BACK

Here and there the farmer is coming b..ck into the automotive market and is giving evidence either that he has a nest egg laid away in the old sock or that he is getting some money out of the sale of the bumper crops he has raised this year. As evidence of this Cuttell Bros., Studebaker dealers at Clarinda, Ia., instance the sale of 48 Studebaker cars since the beginning of the present selling season. Of these 36 were sold out of the Clarinda sales rooms, 16 to farmers and 20 to townsmen. Of the farmer buyers two paid \$1820; nine paid \$1420; five paid \$1080 each for their cars. This does not look much as if the farmers are "husted" in Iowa.

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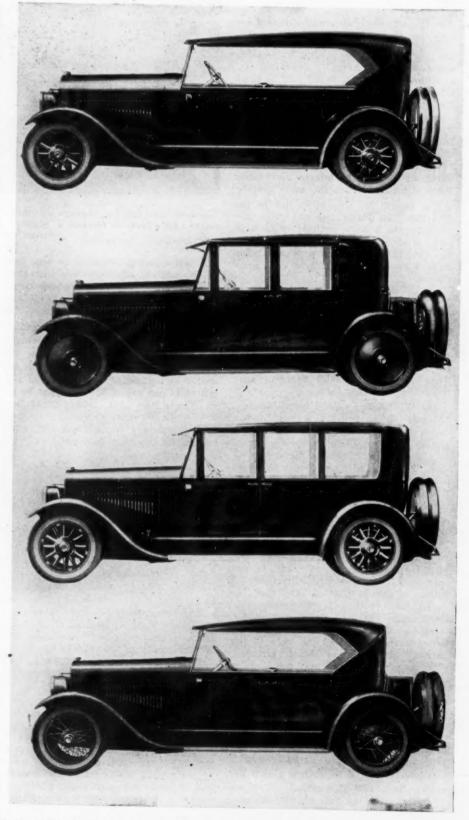
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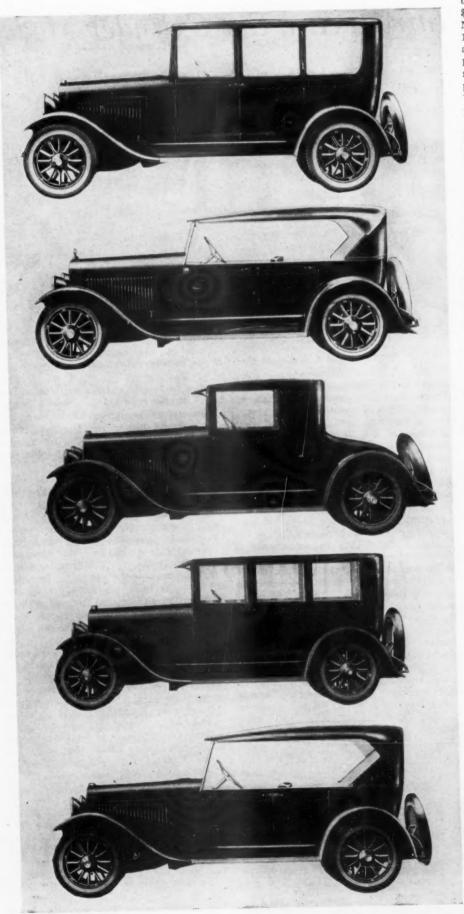
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## R. & V. Knight Introduces a Six-Cylinder Model

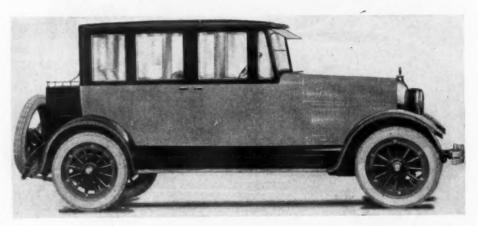
Engine Shows Up Well in Road Tests for Acceleration and General Performance. Frame of New Car Exceptionally Sturdy, With Springs Swivel Mounted

A N entirely new car designated as Model H has been brought out by the R & V Motor Co. The new car has a six cylinder Knight engine, and while it is of the same size as the one which the company has been building for three years, important improvements have been made, chief of which is the installation of a four bearing instead of a three bearing crankshaft.

The new engine develops considerably more horsepower and is capable of higher sustained speeds. The company states that in tests this engine has actually shown 4350 r.p.m. The chief reasons for greater horsepower and fuel economy lie in the improved intake manifold and fuel economizer. These are entirely a development of the R & V Co. Better engine performance also has been obtained by the use of light weight iron pistons and alloy steel connecting rods. To improve the wearing qualities, the eccentric shaft is made of chrome nickel alloy steel.

Other improvements in the power plant are incorporated in the transmission and single drive plate clutch. On the transmission the control levers have been more conveniently located. Externally the new car has little resemblance to the former model. The v-type radiator which has featured all R & V Knight and Moline Knight cars since 1914 has been replaced by a flat front radiator which is nickel plated. The radiator is of better all around construction of honeycombed section and permits of installation of automatically controlled shutters. Cooling is further improved by adoption of the propeller type two blade fan. There is also a better, arrangement of the water jackets in the engine itself.

The company has devoted considerable attention to the lines of the car which



New R & V Knight Model H five passenger club sedan

are an Improvement over the former six. There is also an improvement in both appearance and sturdiness of construction in the sheet metal parts. The windshield is of a built-in type, having two integrally mounted glass shutters on the side which serve both as ventilators and dust shields. The top is of permanent construction, being, however, no heavier than the ordinary cape top. The winter enclosure for the car is so well worked out that the open cars are very comfortable cold weather vehicles.

Among the details of refinements is the mounting of the steering gear which is so arranged that the position of the wheel can be arranged to suit the driver's convenience. Ample space for tools has been provided in a leather lined pocket in the left front door and this pocket is fitted with a lock. Provision for carrying the heavier tools, such as the jack and tire chains, is made in a box under the front seat. The gasoline tank is of very large capacity and equipped with a mercury sealed gage integral with which is a reserve

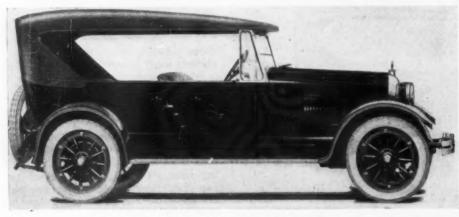
valve to insure against running out of fuel on the road.

Electrical equipment has been improved and the wiring has been made much more accessible. The 153 ampere hour 6 volt battery is placed under the left front seat.

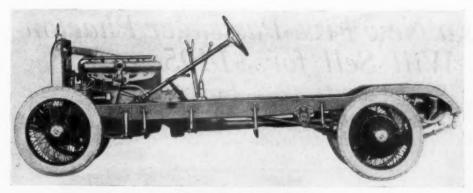
The front bumper is part of the regular equipment and snubbers are also furnished as regular equipment. One of the rather unusual features of the R & V Knight six is its spring suspension which provides 103 in. of springs on each side of the car, the wheelbase of which is 124 in. The front spring is 42 in. long and the rear 61. In a test of this car by a representative of this publication exceptional riding qualities were noted over extremely rough roads and at speeds of about 35 to 40 m.p.h. This in a large measure is due to the method of suspending the springs from the frame. The rear ends of both front and rear springs are mounted in a swivel suspension which naturally eliminates side strains to the frame member.

In all there will be five body styles on model H chassis, including a five passenger touring at \$2850; seven passenger touring, \$2900; four passenger sport, \$2850; five passenger club sedan, \$3500, and a seven passenger sedan at \$3700. All open models are upholstered in leather, while cloth and plush are used for the closed jobs. The touring cars are finished in dark blue and dark green grey, while the club sedan is finished in a pelican gray with black trimming. One of the chief features of the new car is the completeness of equipment which in addition to the usual line includes a cigar lighter, primer and tire chains, extra tire, stop light, two windshield cleaners, rear view mirror and transmission lock.

The major specifications of the engine



R & V Knight Model H seven passenger touring



R & V Knight Model H Chassis

show a bore and stroke of 31/2x41/2 in., giving an N. A. C. C. rating of 29.4 hp. The piston displacement is 259.8 cu. in. The horsepower for a model H engine shows 56.5 maximum hp. obtained at 2400 r.p.m. The foot pounds torque is 149 and 124 at 800 and 2400 r.p.m., respectively. The compression pressure is 80 lbs. A three point suspension is used for the engine. Cylinder heads are individual for each cylinder and have one junk ring and one head ring. Cylinder bores are completely surrounded by water, which is circulated by thermo-syphonic action, the total water capacity being 7½ gal. The engine block is cast iron, while the crankcase is of aluminum thoroughly ribbed for strength.

The sleeves are made of fine gray iron, heat treated and seasoned before machined to eliminate warping. The sleeve travels at only 1/9 the speed of the piston. The sleeve moves only 1 in., which means that the wear is inconceivable when the bearing area is considered in connection with this small amount of movement. Even should slight wear occur on the sleeve surfaces, this is immediately filled in by the building up of carbon, which makes the sleeves round, and seals the engine that much more effectively. The intake port opening is 7/16x31/8 in., while that of the exhaust is 1/2 x 2 3/8. A special composition bronze is used for the sleeve rods, in order to give strength and good bearing surfaces on the crankpins of the eccentric shaft. A Whitney silent chain % in. pitch and 114 in. wide is used for operating the eccentric shaft. While the accessory drive chain is 34 in. wide.

A very stiff crankshaft is used and dynamical balanced together with the flywheel and clutch on a sensitive balancing machine. The sizes of the crankshaft main bearings are as follows:

Crankshaft-

rankshaft—
2½ dla. by 2½ long.
2 5/16 dia. by 2 5/16 long.
2% dla. by 2 7/32 long.
2 7/16 dia. by 3 long.

The dimensions of the eccentric shaft bearings are as follows:

Eccentric Shaft-

1% in. din. by 2 in. long.

2 1/16 in. dia. by 2% in. long.

2 1/16 in. dia. by 2\% in. long. 2 1/16 in. dia. by 2\% in. long.

Light weight Double-Seal pistons are fitted with two Double-Seal rings, one

set against compression and the other against suction. The piston pin is 1 in. in diameter.

Oil is supplied under pressure from a gear pump located in the sump to the main bearings, crank bearings' and eccentric bearings. A supply of oil is delivered also to the timing chains in the front end. One and one-half gal. of oil per minute are delivered by the pump when the engine is running at a speed of 1000 r.p.m. The oil reservoir holds 10 qts. lubricant.

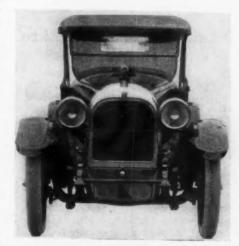
Vaporization of the fuel is taken care of by a Stromberg 11/4 in., plain tube, horizontal outlet type of carbureter. Working in conjunction with an exterior intake manifold, which is heated at the lower central portion by a hotspot. A small flexible tube carries the exhaust gases from this hotspot to the rear of the car.

In unit with the engine is a Brown-Lipe model 30A clutch and gearset, while the drive to the Timken rear axle is taken through a Spicer shaft and joint. The gear ratios in the transmission and axle are as follows:

In tr	an	N-			
mis	sio	en.	In	axl	e
High1.00	to	1	5.4	to	1
Second1.68	to	1	9.0	to	1
Low3.33	to	1	17.9	to	1
Reverse 4.35	to	1	23.5	40	1

The front axle is a Timken. Both the drive and torque are taken through the

The frame in this car is a good example of the modern tendency toward



Front View of Model H touring

the adoption of more rigid frames. The side rails in this case are 7 in. deep with 21/4 in. flanges and made of 5/32 in. stock: To eliminate the possibility of twisting the frame rail, there are three heavily gusseted cross members and a tube at each end is riveted to the end members of the frame. In order to better the universal joint action, the engine is placed in the frame 34 of an inch lower at the rear.

A Jacox Model L-2A-17 worm and nut type steering gear is used and so arranged that by loosening the bolts which hold the steering gear bracket and instrument board the entire steering gear can be moved up or down to suit the driver. A sliding trim plate cover on the floor board takes care of the movement when adjustment is made.

The electrical equipment includes an Auto-Lite two unit six volt single wire system. The starting motor has a gear reduction of 11 to 1 with 21 ft. lbs. of torque. There is a combination ignition and light control switch so arranged to allow the tail light to burn alone by turning the switch between the bright and dim position. A seven point fuse and junction block is placed on the engine side of the dash and one of the features of accessibility here lies in the fact that the body can readily be detached from the chassis, in as much as there is a ready means provided for breaking the electrical connection at this point.

## Service Policy

"We have rather an open policy as respects service," says E. E. Herring, manager of the Atlantic Automobile Co., Atlantic, Ia. "We are very careful not to antagonize a customer for a matter of \$2 or \$3. Possibly we are imposed upon a little once in a while because of this, but we find most people are reasonable and fair and any sort of a controversy is of rare occurrence. But when it comes to the point of losing a customer over some small matter, we just won't do it, that's all. To get a new customer to replace one lost costs us at least \$25 in advertising, so why lose one for \$2 or \$3? Using the flat rate, or rather, the recommended Ford rate, as all Ford service stations do, we find the chances for a misunderstanding or controversy reduced to a minimum."

Federal-aid roads placed under construction in October amounted to 1,189

From 19 to 35 cents per hour is the range of wages for common labor on Federal-aid roads, east of the Rocky Mountains. West of the mountains the average is about 43 cents.

How climate affects the highway working season is shown by the fact that grading can be done on 100 days of the year in Oregon, 110 in Maine, 260 in Maryland and 300 in most of the south-

## Kissel Announces a New Five-Passenger Phaeton Which Will Sell for \$1495

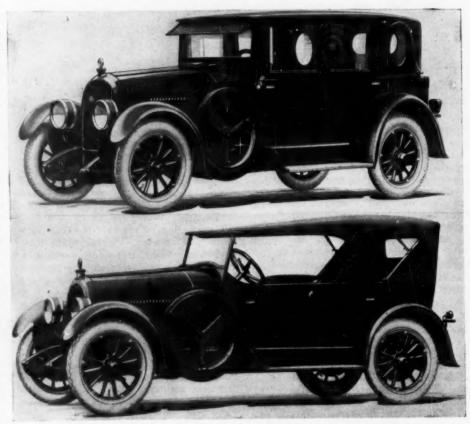
Car Uses the Same Chassis as the DeLuxe Models. Stroke in Engine Has Been Slightly Reduced. Wood Wheels Standard Equipment

THE Kissel line for 1923 will include among other models the new five passenger phaeton selling at \$1485 and a new sedan body style known as the brougham sedan. The same chassis on which the Kissel DeLuxe models were mounted is used for the new cars. This has a 132 in. wheelbase and is fitted with a frame having 7 in. side rails. Front and rear springs are semi-elliptic, the front and rear being respectively 38 and 56 in. long. Both front and rear axles have Timken bearings, the rear axle being a pressed steel housing with spiral bevel gears and alloy steel driving shafts. The brakes are 15½ in. in diameter. All details of the transmission, clutch and steering gear are practically the same as on former models.

The frame has a kick-up over both axles, permitting a low center of gravity and better performance of the car on the road. All chassis squeaks and rattles have been eliminated, it is said, by the Kissel patent pin side play adjustment in the springs, while hand fitted, bronze, graphite, oilless bushings are used at all small moving parts.

Some changes have been made in the engine, the principal one being the reduced piston stroke which is now 51/8 in. instead of 51/2 in. The bore of 3 5/16 in. remains the same. The crankshaft is 21/2 in. in diameter, dynamically and statically balanced and gives an increased surface to both the main and connecting rod bearings. Tests on the road are said to have shown an acceleration from 5 to 60 miles an hour in 30 seconds. One of the refinements in the engine is the accurate balancing of pistons and rods, the pistons being fitted into the cylinders with a .002 in. clearance. Lubrication includes an automatic oil control, which supplies oil to all the working parts automatically and eliminates flooding of the engine at low speeds and increases the flow and pressure as the throttle is opened. To insure uniform running temperatures, a thermostatic control is built into the new

The new brougham sedan has many earmarks of a built-to-order job and is designed in a compact manner so that all available room is utilized, making it rather unusually comfortable for a car of this kind. It is finished in Holland blue body with black patent leather Pantesote top. The car is also featured by large windows and wide doors. The doors are hand made for the particular car for which they are intended. The



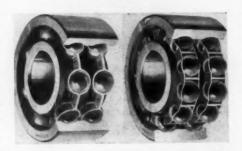
At the top is the new Kissel brougham sedan, while the phaeton is shown below. Both are high class body jobs

fenders are of full crown design, rolled, and so modeled as to form a part of the car's appearance as a whole.

On both the phaeton and brougham sedan wood wheels are standard equipment, with spare rims on both sides of

the hood. An individual three-quarter length coach step which was designed originally for use with the Kissel coach sedan is used. Silver plated guard rails at the rear and trunk rack also are standard equipment.

## Strom Bearings Added to U. S. Ball Bearing



The U. S. Ball Bearing Mfg. Co. has recently added the Strom double row bearing to its line of single-row radial,

angular contact and thrust bearings. Strom double-row bearings are of two types, standard and maximum. One of the features of these bearings is the retainer construction. Two independent riveted retainers are used, one for each row of balls, thereby insuring the same strength in each retainer as obtained in the single-row type of bearings. They are especially adaptable for installations requiring unusual bearing capacity in a limited amount of space.

These bearings are designed to carry heavy radial loads. However, owing to their construction, they are capable of supporting thrust loads also. They are especially adaptable for application to somi-floating rear wheel construction, pinion shafts and transmissions.

## New Engine Used in 1923 Line of Gardner Cars

Five-Bearing Crankshaft Feature of Powerplant. More Power Also Developed. Larger Clutch Also Installed. Body Styles Remain About the Same

HE outstanding feature of the new Gardner 1923 model is the use of the five-bearing crankshaft, Lycoming engine. This is a higher speed engine than that used formerly and is said to be exceptionally free from vibration. The engine develops 43 hp. at 2150 r.p.m. and because of its greater power the car is capable of better acceleration without sacrificing its economy.

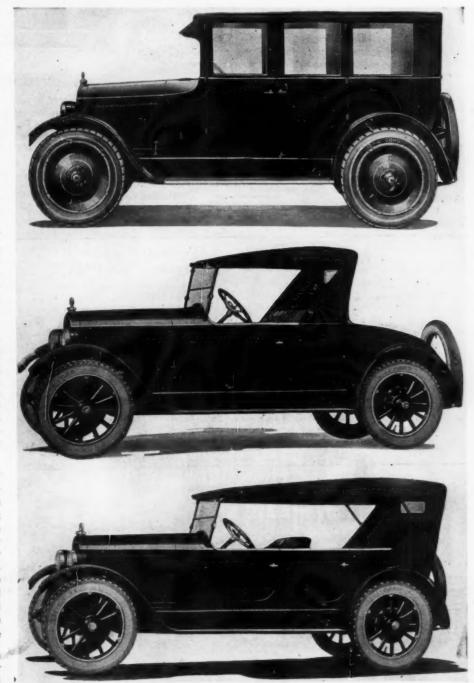
One of the interesting things in connection with the engine is the oiling system, which is of the full pressure type. The entire circulating system is contained in the upper half of the crankcase. The gear type of oil pump is driven by spiral gears located in the center of the camshaft. It is supported by the upper half of the crankcase, but extends down into the oil reservoir. This construction permits removal of the oil pan without interfering with the other parts of the lubricating system. The pump intake is always immersed in oil and requires no priming.

The pump discharges directly into a distributer tube case into the upper half of the crankcase. This tube is connected by holes drilled through the webs to all camshaft and main bearings. A nozzle on the front end of the distributer tube directs a continuous stream of oil into the timing gears. Valves, push rods, pistons and piston pins are lubricated by oil thrown off of the crankshaft.

Outside of the adoption of the new engine, which previously has been described in Motor Age, the chassis is quite similar to that used last year, but the frame has been stiffened and the front cross member redesigned in order that the front end of the engine may rest in a bearing above the support. This arrangement facilitates access to the gears at the front end. The hand brake is now located on the forward end of the propeller shaft so that only the foot-operated hand brakes are on the rear wheel drums.

Layout of the brake levers and actuating mechanism has been simplified and improved in detail, while the foot brake linings are 2 in. longer and have been increased in width from 1% to 2 in. The brake equalizers are now eliminated and the return spring is arranged beside the drum at the end of the linkage so that all play is taken up before the pedal is applied. The brake arms have been reversed so that the bands have a greater self wrapping action.

Springs have been added at the brake shaft, brake camshaft and at one point



Three of the Gardner models, from top to bottom, the sedan, roadster and phaeton. More leg room has been provided in the front compartment and the seats have been made 2 in. wider. More clearance also has been provided between the clutch pedal and body side.

Instruments are now all separately mounted on a new board

in the steering column for the purpose of eliminating rattles. The Flint rear axle has been strengthened and the brake anchorage is now made in one piece with the spring seat. The gear ratio on all models will now be 4.8 to 1, the same ratio as that used on enclosed models last year. A higher grade of

steel is now used in the differential gears.

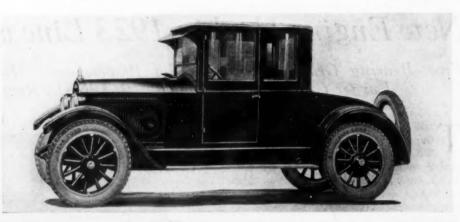
The larger engine has made it desirable to use also a larger Borg and Beck clutch, 10 in. instead of 8 in., and to increase the face of the gears in the gearset by ½ in. The gearset is a Mechanics Machine Co. product, as are also the uni-

versals. A slight change has been made in the gearset casing to provide support for the brake anchorage and a spring is used to prevent rattle of the change lever. The latter is longer and has a ball end. The hand brake has a spoon shaped release handle instead of the button type used before. Gearset ratios are increased to the following: Low, 3.07 to 1; intermediate, 1.76 to 1; reverse, 4.01 to 1.

The only changes of importance in the Flint front axle are the use of ¾ instead of ⅓ in. kingpins and the addition of hardened thrust washers at the knuckle pivot. The Ditweiler steering gear has larger column tubes and larger worm gears, but the reduction in the gears remains as before.

A few minor changes have been made in the electrical equipment, but the same major Westinghouse units are employed. The Carter carbureter is a vertical instead of a horizontal type. The muffler has been moved back farther than formerly and a tail pipe, used only on enclosed cars last year, is now fitted on all models.

Body lines remain the same as last year, but the seats are about 2 in., wider, the front seat has been moved back a small amount and the toe boards moved ahead, so that the total leg room in front is increased by 2¼ in. More clearance



The Gardner business coupe which, among other refinements, has a large carrying compartment at the rear, measuring 31 by 43 by 13 in. The roof construction consists of cross bows covered with fine mesh wire screen and heavy duck, padded to give a smooth appearance and to prevent sagging

is also provided between clutch pedal and body side. Instruments are now all mounted separately on a new instrument board.

Body models include a phaeton, road-

ster, sedan, coupe and sport. The latter is painted Packard blue, has Spanish leather, brown top, nickel lamps and radiator, glass wings, rear panel bars and trunk rack.

## Clydesdale Has Six Models for 1923

A NEW series known as models 10, 8, 6, 4, 2 and the "Oil Field Special" has just been announced by the Clydes-

dale Motor Truck Co., Clyde, Ohio.

Model 10 has 138-in. wheelbase and is designed to carry 3750 lbs. body and pay load on a 9-ft. body. The engine is 3% by 5 in. unit with transmission; tires, 34 by 5 in. cords on disc wheels; electric lighting and starting system is included in the chassis price of \$1485 with bevel drive axle and \$1535 with worm drive axle. A complete line of bodies is offered with this model.

Model 8 is built in 156-in, and 170-in. wheelbase lengths to carry up to 6200 lbs., body and pay load, on 10 and 12 ft. bodies respectively. The engine is 4½ by 5½; transmission is suspended amidships, and tires are 36 by 4 front and 36 by 7 rear. The chassis price is \$2650 and \$2700.

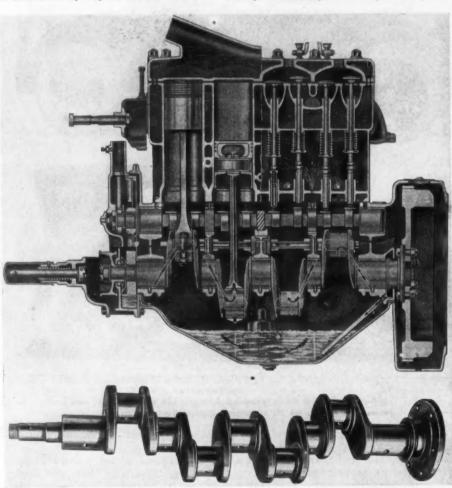
Model 6 is offered in 163-in. and 180-in. wheelbases and will carry up to 9800 lbs. body and pay load. The engine in this model is 4½ by 5½; tires, 36 by 5 front and 36 by 5 dual rear. The chassis price is \$3650 and \$3700.

Model 4, in 177-in. and 197-in. wheelbase, is equipped with 4% by 6 engine and 36 by 6 front and 40 by 6 dual rear tires. The carrying capacity is 12,000 lbs. including body and pay load. The chassis price is \$4300 and \$4350.

Model 2 also has a 4% by 6 engine; tires, 36 by 7 front and 40 by 7 dual rear. The carrying capacity is 17,000 lbs. body and pay load. The chassis price is \$4750 in 176-in. wheelbase and \$4800 in 204-in. wheelbase.

Continental engines, Timken axles, and Brown-Lipe transmission are used throughout.

The "Oil Field Special" is of the same general specifications as Model 6 but has a heavier frame, and unit power plant in conjunction with auxiliary amidships transmission, providing a total of nine forward and three reverse gear ratios. The wheelbase length is 170-in. and the chassis price \$4300.



Sectional view of the Lycoming engine used in the Gardner and below, the five-bearing crankshaft. Note the liberal water spaces between the cylinders of the block and the large bearing sizes

## H. C. S. Out With a New Six-Cylinder Car

Chassis Somewhat Larger Than Four-Cylinder and Has Several Novel Features, Including Auxiliary Driveshaft. Four-Cylinder to be Made Also

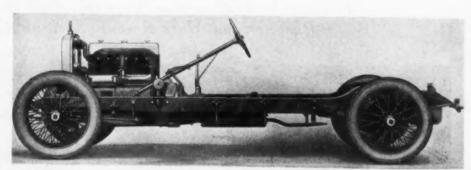
HE H. C. S. Motor Car Co., of Indianapolis, this week enters the field of the six with a brand new six-cylinder touring car which will be displayed at the New York show. While introducing the new six, the company will continue to produce it's four-cylinder model, a new series of which was recently announced. The six touring car will be sold for \$2650, while the four-cylinder H. C. S. touring price has been revised downward to \$2250.

The engine of the new six-cylinder model is a special H. C. S. design built by the Mid-west Engine Corp. for the H. C. S. company. It has a bore of 31/2 in. with a stroke of 5 in., 29.4 S. A. E. horsepower rating and a brake test of 80 hp. at 2850 r.p.m. The powerplant was designed with simplicity and accessibility in view; the engine is of the overhead valve type, with Brush type lubrication by which the amount of oil flow is governed by engine speed. Being of the block type, the engine with detachable head and aluminum valve cover, aluminum crank case and oil base, is of clean design. Integral inlet and exhaust manifolds on the left side and a pump and electrical units on the right add to the appearance of simplicity.

The chassis of 126 in. (six inches longer than that of the four-cylinder model) has several features that are unique. One of these said to be entirely new to American practice is an auxiliary drive shaft with two universals located aft of the gearset and anchored to an amidship cross member. This, with its two universals, minimizes road shock and the possibility of misalignment of parts. Because of the construction of this shaft it is said that the gearset can be taken out of the car in 30 min. Another novel feature that makes for accessibility is a hand operated brake adjustment located just under the front seat boards. The tool tray carried under the floor boards of the tonneau is at once out of the way and easy to get at.

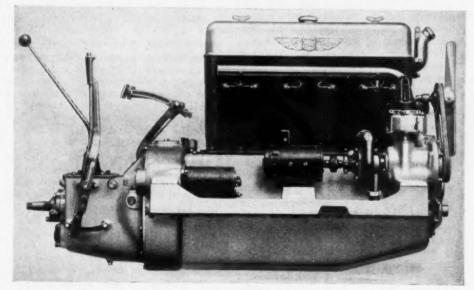
In appearance the new six model conforms to H. C. S. ideas with a low hung body maintained with standard clearance. The body, like the chassis, is longer than previous models of this maker with 4 in. more room in the tonneau and 3 additional inches in the driving compartment. Adjustable brake and clutch pedals permit several inches more of leg room for the tall driver.

A one-piece ventilating windshield with wide rubber flange where it meets the cowl, makes for a water-proof driving compartment and similar rubber insets at the sides of the shield make close contact with the metal supports.





The touring model and chassis of the new H. C. S. six-cylinder model. The chassis is 6 in. longer than the four-cylinder model. It is said the gearset in this chassis can be taken out in 30 min., should this become necessary. It gives some idea of the chassis accessibility



The right side of the new H. C. S. six-cylinder engine. The engine has a bore of 3½ in. and a stroke of 5 in. It is said to show 80 hp. at 2850 r.p.m.

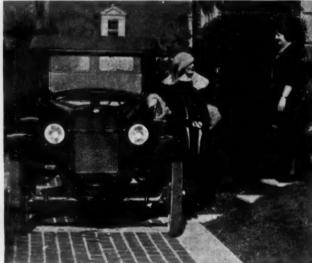
New type wire wheels with positive locks with two wheels mounted on either side of the hood are standard, but Bud-Michelindise wheels are optional without

extra cost. The five-passenger touring type is the only model of the new six, but it is intimated that other types will be added later.

## Willys-Overland Brings Out New Willys-Knight Coupe-Sedan

Several Changes in Evidence on New Overland Bodies, Including Higher Radiator and More Room. Springs Also Lowered





These two views are of the new Willys Overland Coupe-Sedan and the Overland Roadster. The top and windshield have been lowered on the Overland models. The Coupe-Sedan is the most recent addition to the Overland line

THE Willys-Knight coupe-sedan combines the chummy sociability of the coupe with the convenience of the sedan, an entirely original body creation of steel. Both front and rear seats are full size, upholstered in mouse-colored velour and cushioned with springs and hair. Doors both front and rear eliminate folding of emergency seats and provides equal comfort for hosts and guests in a big, roomy body that holds five passengers with comfort, giving the comfort of the sedan with the friendliness and coziness of the coupe. Front windows lower entirely out of sight.

The long cowl and hood, adorned with a nickel plated radiator shell and nickel plated head lamps of barrel design, and nickel plated bullet cowl lamps, give the car a smart appearance. It is painted a Willys-Knight blue on cowl, hood and body.

A water-proof top material is used, and aluminum kick-pads, added to the running boards, are another little touch of refinement. Interior instrument fittings and appointments add to the general feeling of comfort and luxury at moderate cost. A large trunk of adequate proportions is provided in the rear.

The radiator of the new Overland has been raised  $1\frac{1}{2}$  inches and is assembled with the shell in one unit. The cowl and hood have been raised a like height, giving a stream-line appearance. The

same distinctive hood catches that have been used on the five-passenger Willys-Knight cars are now standard equipment of the new Overland.

The front splasher and front end of the fenders have been slightly redesigned to eliminate rumbles. Anti-squeaks have been added to the running board splasher, body and frame.

The body of the car is wider and bigger in every way. There is ample room, even for a stout person, to enter the front door on the steering wheel side, a convenience that is appreciated by many. The beads have been omitted from the doors and body, making a much neater looking finish.

The top and clear vision windshield have been lowered two inches. Gypsy curtains, integral with the top itself, adds to the joy of motoring. Fastened from the inside, they open with all four doors.

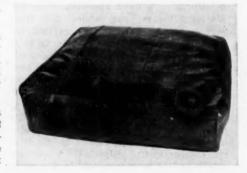
Both front and rear seats have been lowered 1½ inches at the front and 2 inches in the rear, giving a more comfortable seating pitch, accentuating the ease of riding of the patented Triplex springs.

The instrument board has been changed so that all instruments are now mounted directly to the board.

Barrel head lamps lend beauty to the general attractiveness of the entire exterior design.

## Goodrich Automobile Seat

Riding on air is no longer a figure of speech but a fact. The B. F. Goodrich Rubber Co. announces a pneumatic automobile seat for Ford cars. According to Goodrich officials, the new seat increases greatly the comfort of driving or riding in a Ford. The seat is adjustable in that it can be filled with as little or as much air as the user desires. No pump is required. The seat can be substituted



for padded cushions without any alterations. It is attractively and durably upholstered, and can be deflated and carried whenever desired. The air is evenly distributed, and a level seat insured at all times.

## Stephens to Build Two Models for 1923

A Smaller Car, Having a 117-in. Wheelbase Has Been Added and Uses the Same Powerplant As In Larger Model. Open Models Feaured By Addition of a Completely Equipped Foursome

OR the first time in its history the Stephens Motor Car Company is producing two models. larger of these follows very closely the design and construction of the former Stephens Salient Six, but there is an addition, a new car of smaller dimensions. The wheelbase being 117 in. as compared to 124 in. on the larger car. On the 117 in. chassis a two passenger roadster, five passenger phaeton and five passenger sedan designated respectively as models 12, 16 and 18 will be furnished. On the larger chassis there will be a four passenger foursome, seven passenger phaeton and seven passenger sedan, designated respectively as models 24, 26

## Radiator Altered In Appearance

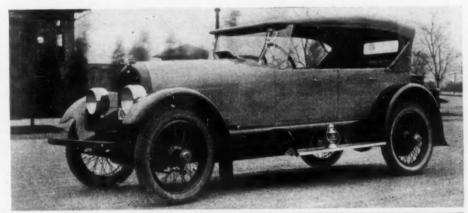
There are several prominent improvements in the 1923 Stephens cars as compared with the previous year's models. To begin with the radiator, a Fedders, has been altered in appearance and has been made one inch higher and slightly narrower at the top with a gradual slope to a wider dimension at the bottom. The shell curves have been made more graceful and fade directly into and make a continuous line with the hood. A rectangular spot has been incorporated in the front of the radiator in which the name plate is located. This by the way has been changed entirely and incorporates only the name Stephens and an old fashioned Greek letter "S".

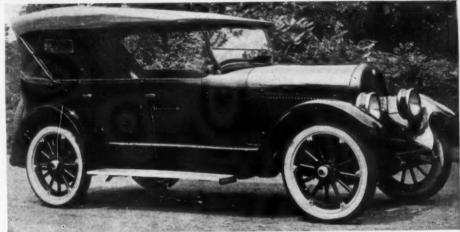
The hood comes slightly lower and provides only enough clearance between the base of the hood and the hood sill to make it a commercial fit. On the cowl is an aluminum beading with a similar bead rolled into the rear of the radiator shell. Between these two beads the hood is fitted. The beadings themselves are unpainted and cover up the opening on both the front and rear of the hood, giving it a much more finished appearance.

The windshield has incorporated in it weather resisting features. The side arms are very long and substantial, but of a design which emphasizes lightness and beauty

## Better Mounting of Lamps

The cowl lights are now of the shrouded lens type with a nickel plated finish. Special attention has been given to applying this finish on the surface which has been perfectly cleaned to prevent any possibility of the nickel chipping





Here are shown two of the new Stephens open models. The foursome, shown above, which is said to be one of the most completely equipped sport type of cars on the market today. Among other things it has a wood bumper. The new body lines are in evidence in the illustration of the seven-passenger, shown below

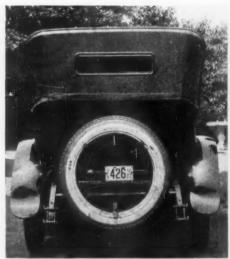
off. The headlights are mounted on swivel brackets attached to the front fenders and by the release of one nut can be adjusted to give the desired forward visibility. The brackets are held in position and the lamps and fenders prevented from vibration by a large steel tube. The stop light and tail light and bracket are in a single unit and on the tail light is a replica of the radiator crest.

There has been a rearrangement of the instrument board. This is metal with a wood back to prevent vibration and rattle. The instruments themselves have been rearranged. The center group is located under a glass cover containing the ammeter, oil pressure gage and water jacket thermometer. On all models the choke is on the left side of the board, the dash light slightly to the

right of center while the ventilator control is directly in the top center of the board. In each instance care has been given to arranging of the instruments in direct range of the driver's eyes so that they will not draw his attention from the road. In the model 24 the instrument board is of walnut.

One of the notable improvements is the substitution of a rim type tire carrier in place of the former stirrup type. The company claims that some difficulty was formerly encountered with the stirrup type carrier from the fact that it was apt to damage the tire.

The backs of the front seats are covered with upholstered material harmonizing with the rest of the trim material of the car. The covering of the front floor boards is of a single heavy rubber





Two of the more important changes in the new Stephens include a rim type tire carrier in place of the former stirrup type and the change in the radiator shape

mat, while a carpet of natural color is used in the tonneau.

#### Tools Carried in Door

A little refinement from the driver's standpoint is the carrying of the tools in the front door. There is a hinged shelf, which when closed is locked against theft, but when opened up provides a convenient and accessible shelf from which the tools can be used, or laid down.

Among the changes in the chassis is the adoption of the Stromberg carbureter in place of the former make. The new carbureter has been adopted primarily to get better car performance, particularly acceleration. Better performance, also, has been secured by the adoption of the Delco system of ignition.

Spring suspension on all models has been slightly altered to prevent "pitching" on the road. The engine of this car, inasmuch as no aluminum is used for crankcase and similar parts, is naturally quite heavy and to properly handle this forward weight and eliminate severe spring action, certain features have been slightly redesigned to make for smooth action on the road.

#### Very Rigid Frame Used

The chassis of the new car, that is the smaller car, uses a rigid frame having six inch side rails and five rigid cross members. It is a straight taper frame and fitted with two torsion tubes two inches in diameter at front and rear end. It is supported by alloy steel semielliptic springs, the front being 37½ in. long and two inches wide and the rear 56 in. long and two inches wide. The latter is underslung.

Spring bolts are lubricated with oil through connections fitted for a positive oil gun. The car uses Hotchkiss drive. The rear axle is a Timken semi-floating type with a gear reduction of 4.66 to one on the open models and 5.1 to one

on the closed. The front axle is also, Timken.

Service brakes are external contracting band type on rear wheels. The brake drum is 15½ in. in diameter and two inches wide. The emergency brake is 8 in. in diameter and 2½ in. wide and is mounted on the end of the transmission. Both the drums on the service and emergency are turned true to get smooth action and power.

The steering gear is a Gemmer, having a reduction of 9½ to 1. The cross shaft is provided with an eccentric bushing to allow adjustment and all wearing surfaces are hardened and ground. Steering wheel is 18 in. in diameter, of walnut with an aluminum corrugated grip.

Wheels are of the artillery type and each is secured to the hub with twelve bolts, which is said to eliminate all chances for squeak. Stanweld straight side rim equipment is used. Wire



A new grouping of the instruments is one of the refinements on the new Stephens

wheels are optional at extra cost. Tires are 32 x 4, Fisk cords on all models.

The engine is a six cylinder enbloc overhead valve type. The cylinder head is removable. The engine is rated at 25.3 h.p. but actually develops 59 at 2750 to 2800 r.p.m. The cylinders have a bore and stroke of 314 by 41/2 in.

Valves are 1% in. in the clear and have a % in. lift. They are of alloy steel and fitted with two springs per valve, for positive operation at high engine speed. The push rods are on the left hand side with outside accessible adjustment. The valves can be adjusted for most efficient operation with a screw driver while the engine is running. The valves are entirely enclosed and the valve action lubricated by oil mist from the crankcase.

Pistons are close grained cast iron, very light and carry three piston rings. The piston pins are one inch in diameter. The bearing for the piston pin is located in the upper end of the connecting rod. The pin itself being held firmly in the piston bosses by a tapered set screw. The connecting rods are drop-forged steel and the caps are fastened with alloy steel bolts.

### Lubrication Is Four-speed Type

The crankshaft is drop-forged .35 carbon steel, heat treated. The large size of this shaft together with its inherently balanced feature is said to manifest itself in the smoothness of operation and lack of vibration. There are three main bearings, bronzed backed and lined with babbitt. The front bearing is 2½ in. in diameter and two inches long. The center bearing is 2½ in. in diameter and 3½ in. long, while the rear bearing is 2½ in. in diameter and 3 inches long. The camshaft is drop-forged steel, driven by spiral gears. Barrel type tappets are used.

The lubrication system is a four speed type with vacuum controlled pressure to main and connecting rod bearings, camshaft bearings and piston pins. The gear pump is driven from a spiral gear on the camshaft. Oil is circulated through the crankshaft which is drilled, thereby helping to take away the heat from the bearings. There is a 2¼ gal. capacity oil base. The relief valve is set to 40-50 lbs. pressure at full throttle opening.

The cooling is of a Thermo-syphon type with a water capacity of seven gals. The fan is fifteen in. in diameter, four bladed adjustable centers and driven by a V belt.

From the engine the drive is taken from a Borg & Beck clutch. A feature of this clutch is the lubrication of the clutch bearings from a transmission through a drilled shaft and by positive pressure type oil gun connection. The clutch pilot is supported on ball bearings. A Mechanic's gearset is used with the following gear ratios: Low 3.25 to 1,

intermediate 1.81 to 1, high 1 to 1 and reverse 4.16 to 1. Two universal joints are used and these are of the metallic type designed to retain heavy oil lubricant and exclude road dust and water, from the bearings. The joints are readily accessible and may be removed without disturbing any other unit. The propeller shaft is a seamless steel tube.

#### Delco Electric System Used

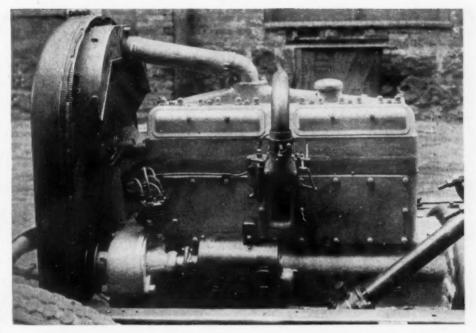
The electric system comprises a Delco starting motor, generator and ignition unit. The current being derived from a Willard storage battery of 113 amp. hr. capacity. A six volt single wire system is used. The generator is placed on the left side of the engine and driven from the timing gear case through a flexible coupling. The ignition unit is mounted on the back of the timing gear case and driven independently of the generator.

Aside from the body alterations already mentioned there are several other refinements in evidence on the new Stephens models. On the model 24, the four passenger foursome, two walnut trim compartments are located on the back of the front seat and a clock is located between these compartments. The hand brake lever is of the locomotive hand grip type. Adjustable foot pedals are provided to suit the driver's convenience. A toilet set containing clothes brush, soap box and soap, whisk broom, polished metal mirror and collapsible drinking cup is carried in compartment in the right hand door. On this model, windshield wings are standard equipment. Also, a hardwood bumper on front end and a trunk fitted with two suitcases and lunch box. Wire wheels are standard equipment on this model.

#### Cars Well Equipped

The standard car equipment includes a safety stop signal, perfection heater on all closed models, Kellogg mechanically operated tire pump, leather upholstery material, motometer, engine heat indicator, tools and jack and a Stewart-Warner 75 mile speedometer.

On the enclosed cars particular atten-



Among the changes in the engine is the adoption of the Delco electric system and a Stromberg carbureter. Note that the distributer is mounted independently of the generator

tion has been given to the placing of the seats for comfort. On the model 18 five passenger sedan, for instance, the front cushions are 43 in. wide and 18 in. deep. while the rear cushion is 45 in. wide and 20 in. deep. The front seat cushion is pitched three inches higher at the front than at the rear, also, true of the rear cushion. Some idea of the roominess will be observed when it is noted that the distance from front seat back to the nedals is 36 to 37 in. From the bottom of the steering wheel to the top of the cushion is 81/2 in. and back of the steering wheel to the seat back is 141/6 in.

Model 18 is fitted with four doors 24 in. wide and each fitted with three hinges for hanging. There are two dove-tailed bumpers to insure alignment and prevent rattle. The right hand door is fitted with a locking handle and key, while the others are fitted with inside locks, operated by small buttons on the side of the door so as to allow of the

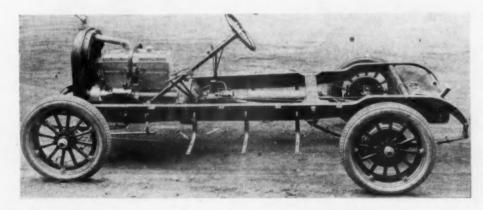
car being entirely locked when not in use. The front door glass disappears when lowered and the rear doors are fitted with concealed pockets, of same material as the upholstery. All doors are provided with double catch door lock plates. Standard equipment includes art metal, silver finished inside hardware, including the dome light. There are silk window curtains on easy running rollers, double windshield wiper and rear vision mirror together with an adjustable sun and rain visor.

One of the alterations in the hand tailored top on the open models is the substitution of a large rectangular plate glass window in place of the former smaller oval type. The side curtains for the open models are made of heavy material and designed to open and close with the doors.

#### Large Compartment in Roadster

On the two passenger roadster the body is featured by a large carrying space under the rear deck. It is accessible through a large water type non-rattling door, fitted with a special device to hold it open. There is, also, a lock on the door. A smaller compartment is located just back of the front seat. This model also carries cast aluminum rear deck guards.

One of the features in connection with the coach work on the seven passenger sedan is the window construction. The plate glass windows slide in noiseless panel guides and the doors are equipped with the crank type balanced and quick-acting, regulators for raising and lowering the glass. The rear quarter windows are fitted with balanced type notched channel glass lifts. There is a natural finished walnut moulding on the inside of the glass openings, giving a rich effect to the general finish of the sedan.



The sturdy chassis of the new Stephens model 12, 16 and 18, which has a 117-in, wheelbase. The frame has a depth of 6 in. and is braced extensively to avoid weaving and distortion.

The powerplant is the same as used in the larger car

## Complete Equipment Feature of New Paige 6-70

Frame Has Been Strengthened by Additional Cross Members. Engine Has a New Type of Front Chain Drive With Automatic Take-Up

OMPLETE equipment characterizes the new Paige model 6-70. This equipment consists of accessories selected and tested by Paige engineers and built into the car at its own plant. Included in the equipment are two extra tires, the tire carriers being installed one on each side of the car and so arranged as to form an important factor of design as well as convenience. The bumpers fore and aft have also been designed to harmonize with the external appearance. There is a luggage carrier on the rear of the touring models and sedans. Both open and enclosed cars are equipped with aluminum scuff The curtains have been implates. proved, being of better material, and are carried in the doors.

On the instrument board the usual group of instruments have been assembled under glass and includes a gasoline gage, a cigar lighter and a clock. Other features of the equipment include the moto-meter, permanent robe rail, and tools carried in the right front door, improved type of drum headlamps, sun visor, rear view mirror, combination tail and stoplight, automatic windshield wiper and aluminum guards on body.

An interesting mechanical development in the  $\epsilon$ ngine is a new type of front



The new Paige 6-70. Note that the method of carrying the spare wheel has been made part of the general design

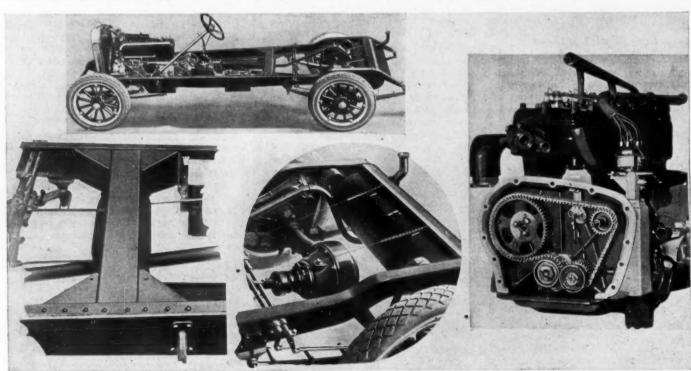
chain drive, a drive with an automatic take-up. The claim for this is the assurance of constant silent operation without the necessity for adjustment.

Another feature which has made for the elimination of body squeaks is the use of anti-squeak material at every point where metal touches metal or metal touches wood. A new type of universal joint has been adopted which is dust proof and retains the lubricant tightly sealed.

The chassis has been strengthened with additional cross members on the

frame. Improved body supports eliminate any possibilities of squeaks and rattles. Shock absorbers are standard equipment. The door handles and hinges are of an improved design with double safety latches on open and enclosed models.

Bright finished leather is used in the open cars and genuine leather is used throughout for all the trimmings. The upholstery is built over deep Marshall springs. A new arrangement of auxiliary seats in the seven passenger model permits of more room.



Some details of the new Paige chassis. At upper left: The arrangement of the various chassis units. Lower left: Constructionally rigid and heavily gussetted cross member. Center: Rear Axle showing the brake control levers and universal joint. Lower right: The new front end drive chain arrangement which has an automatic take up

## Flint Six-Cylinder Latest Addition to Durant Line

Largely Made Up of Assembled Standard Units But Includes Many Exclusive Durant Features

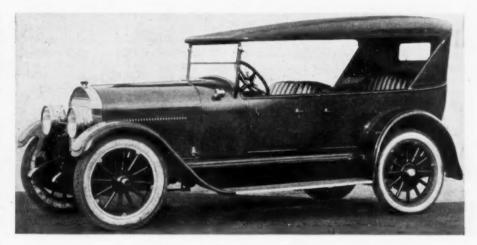
HE motoring public will get its first chance to look over the Flint, recently added by Durant, at the Hotel Commodore, New York, during the week of the show. The full Durant line now includes, besides the Flint, the Durant Four, Durant Six, Locomobile, Star and the Mason Road King Truck.

The Flint will be made at Flint, Mich., and, fitted with a phaeton body, will sell for \$1195. A four-passenger coupe and sedan, selling respectively at \$1895 and \$1985, comprise the enclosed models. As in the Durant models and the Star, the newcomer is largely made up of assembled standard units, but the design includes many exclusive Durant features. One of the most interesting of these is seven bearing crankshaft and chain drive camshaft. It was especially designed for this car. The engine is fitted with a hot-spot type manifold and carburetion is effected through a Stromberg carbureter fed by a Stewart vacuum tank from a 20-gal, tank at the rear of the car. The entire electrical system is Auto-Lite with the coil placed on the engine close to the distributor to shorten the wires. The generator is driven through the pump shaft with two flexible couplings. Lubrication is by force feed to the connecting rod and main bearings, and a gear pump circulates the oil.

The radiator is a Fedders with a thermostat built into the return pipe on top of the engine. Cooling is further carried out by a 16-in. four bladed fan driven by V-belt. The engine is fourpoint suspended on a tubular sub frame consisting of 21/2-in. steel tubes welded into the front and center cross members of the main frame. These tubular sub frame members carry out the Durant idea of adding to the rigidity of the frame by longitudenal tubular members.

As in other Durant models, the engine and gearset are separate, the connection between being made by two Spicer uni-The clutch is of the single plate multiplying lever type and is completely inclosed in the flywheel. gearset affords three speeds forward and the usual reverse. Final drive to the semi-floating rear axle is taken by an open propeller shaft fitted with two Spicer joints. Hotchkiss drive is used for propulsion and torque. The rear axle is an Adams, using spiral bevel gears. Both sets of brakes are on the rear wheels.

The Flint frame has a depth of 51/2 in. and a flange of 1% in. It is made of 5-32 in. stock and has three cross members with a tubular member at the rear.



The frame stiffness is added to by the tubular muffler, which is flange bolted to the center and rear cross members. The steering gear is a worm and wheel type Warner, having an 18-in. wheel with full wood spokes and rim.

A short gearshift lever is used, the height of which comes flush with the top of the seat cushion. The lever when in the rearmost position rests very close to the seat and therefore does not interfere with entrance to and exit from the front compartment. The brake lever is placed alongside the front door rather far forward so as not to interfere with the use of this door.

The car has a wheelbase of 120 in. and is equipped with 32 by 41/2 in. Fisk tires. Chassis lubrication is effected by the Alemite system.

## 23 Years Ago This Week In MOTOR A

These items are taken from Motor Age of Jan. 4, 1900.)

From the Table of Contents

Railway Company Shows Fight-A Boston elevated road employs advertising space to prejudice the public against autos.

May Bar Gasoline Rigs-A New York official discovers a statute which he says makes use of gasoline a violation of law.

Problems Worked Out—Two more mediocre tire patents. A new rotary engine. The Atlantic automobile.

The Dictionary Has Changed It is not strange that the word "auto-mobile" which was first used in France should savor of the French methods of pronunciation in this country, despite the fact that such authorities as the Century and the Standard distionaries do not countenance such pronunciation. According to both these dictionaries the accent comes on the third syllable and the last one is given the sound of "bil," not "beel" as the French have it. The word is therefore pronounced "au-to-mo-bil."

If the French pronunciation be used,

which it should not be, the way to pronounce the word is au-to-mo-beel, with the same accent on each of the four

syllables.

(In the 23 years which have passed since the foregoing was written the dictionary authorities apparently have changed their rule, for the latest edition of Webster's New International Dictionary gives both of the following pronunciations as correct: au-to-mo-bil, au-to-mo-beel.—Editor.)

Notes of Interest

A French electric is reported to have been run 124 miles without recharging. After numerous delays, the Elgin (Ill.) Automobile Co. has turned out its first complete vehicle, a runabout.

The Automobile Club of Great Britain has a membership of 588 persons. That is an increase of 48 members in five weeks. The club had only 163 members

on Jan. 1, 1898.

The Italian army is now studying the advisability of introducing the automobile. It is considered that it could be used for transporting ammunition from the rear to the firing line and for carrying the wounded to the nearest hospital. American Electric Moves

The American Electric Vehicle Co., the pioneer automobile concern of Chicago, and one from which a number of the prominent makers of electric autos have graduated, has moved its factory to Jersey City and will soon establish of-

fices in New York City.

## Brief History of New York Show

In Early Days Rival Manufacturers' Organizations Strove for Supremacy in Field of National Exhibitions

HE Chicago national show has run along smoothly for 23 years under the direction of Samuel A. Miles, in marked contrast to its sister exhibition in New York, the history of which brings out most forcibly the evolution of control that has brought the National Automobile Chamber of Commerce into existence.

The original promoter of the New York show was the National Association of Automobile Manufacturers, which cooperated with the Automobile Club of America in staging the first exhibition in Madison Square Garden in November, 1900. Under these combined auspices the New York shows were held until 1907. when the famous Selden patent suit was started against Henry Ford. brought about a sharp division in the ranks of automobile manufacturers, the "independents," made up of those who refused to recognize the Selden patent, forming the American Motor Car Manufacturers' Association, of which Alfred Reeves, present head of the National Automobile Chamber of Commerce, was general manager.

The Seldenites organized the Association of Licensed Automobile Manufacturers and each promoted shows which were held at the same time. The A. L. A. M. grabbed the Palace away from the National Association of Automobile Manufacturers, the disinterested organization which was still alive and composed of makers on both sides of the fence. The "independents" made their display in the old Grand Central Palace, the predecessor of the present home of the show.

#### Three National Organizations

During this state the industry found itself with three national organizations—the National Association of Automobile Manufacturers, the Association of Licensed Automobile Manufacturers and the American Motor Car Manufacturers' Association. The Selden decision, however, straightened out the tangle, the industry getting together and forming the Automobile Board of Trade, which absorbed all interests. The title of this organization did not satisfy, however, and the name was changed to the National Automobile Chamber of Commerce.

Although the automobile show period began as far back as 1898, the first real automobile show did not take place until two years later. A few automobiles were shown in the same exhibition with bicycles, both in New York and Chicago shows in 1898 and 1899.

At this first show there were 31 exhibitors of complete motor cars and 20 concerns showing parts and accessories, but there was not a sufficient number of

exhibits to fill the large area of floor space in the Garden, and so a flat oval track for showing the cars in motion was built around the floor. On the roof was erected an incline designed to show the hill-climbing capabilities of the machines. Persons who wished to cross from the enclosure to the booths on the outside of the track were transported over a bridge spanning the track.

It is rather amusing at this day to contemplate the exhibits that marked the first automobile show in 1900. Steam-propelled vehicles were easily in predominance, with a goodly number of electrics, while gasoline machines showed a bad third, in striking contradistinction to the order of today. There are a number of concerns—big powers in the automobile industry at the present time—who were represented at the first automobile show.

#### Rapid Growth Apparent

The second national show was held in the Garden during the week of Nov. 2-9, 1901. A striking evidence of the growth of the automobile industry in one year is cited by the fact that at the second show there were 93 exhibitors as compared with a total of 51 exhibitors at the first show. At the second show the track was omitted, but persons were given exhibitions around the basement floor and also in the block around the Garden. Several individuals who owned foreign cars kindly loaned them for exhibition purpose, so that the second show really had an international flavor.

Such rapid strides had been made in the development of the industry that it became apparent that some national association of manufacturers would be needed to assume control if the industry hoped to develop commensurately with its prospects, as the commercial side of the automobile just was beginning to assert itself. The National Association of Automobile Manufacturers was organized.

There was no show in 1902 and the third one was held in the Garden during the week of Jan. 17-24, 1903, and more than 150 exhibitors were represented. For the first time a foreign exhibitor was represented directly.

The fourth national automobile show was held at Madison Square Garden from Jan. 16-23, 1904. One hundred and eighty-five exhibitors were represented this time. A year later the industry had grown to such an extent that many companies applying for space had to be refused. The fifth show was held from Jan. 14-21, 1905, and 250 exhibitors had space. With the 1905 show the contract between the N. A. A. M., the Madison Square Garden and the Automobile Club of America expired, and the Association of Licensed Automobile Manufacturers

obtained a lease of the Garden for several years, with an option of renewing it.

Each year saw more exhibitors. The sixth show held in the Garden, Jan. 13-20. 1906, had 50 exhibitors of cars and 170 exhibits of parts and accessories. The 1907 show had 42 exhibits of cars and 202 exhibits of accessories. There was another show that same year. It was held in the Garden during the week of Nov. 3-10, while the other was held in January. There were 68 exhibits of cars. a number of commercial vehicles and more than 225 exhibits of accessories. The ninth national show was held in the Garden, Jan. 16-24, 1909, and had 48 car exhibitors and a host of parts and sundry manufacturers.

The national exhibition held Jan. 8-15, 1910, numbered a total of 323 exhibitors, 54 showing cars, 23 motorcycles and 246 accessories. The year 1911 saw 393 exhibitors in part I, or the pleasure car section, of which 67 were cars displayed. Part 2 had 27 truck and wagon layouts. In 1912, during the two weeks, there were more than 440 concerns displaying their goods. Sixty showed pleasure cars, 32 truck and wagon displays, while the balance was made up of accessories and motorcycles.

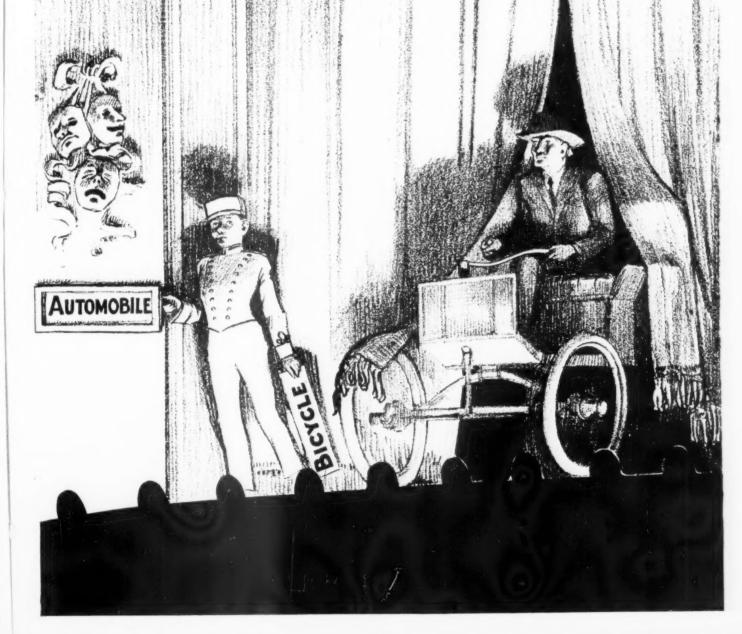
In 1913 there were more than 545 exhibitors constituting the displays in the show, which was held in both the Grand Central Palace and the Garden. On the Garden list were 43 makers of pleasure cars and 272 accessory concerns exhibiting the first week. The Palace for the first week had 50 exhibitors of pleasure cars and 25 displays of motorcycles and more than 100 makes of accessories. During the Part II period, 25 companies showed commercial vehicles in the Garden, while in the Palace 41 truck makers displayed their product. The 1914 show was held in the Palace and there were 350 displays in all. The 1915 national show displayed 368 exhibits and was held

#### Each Year Greater Than Ever

The 1916 show in the Palace attracted 391 exhibitors, of which 81 were car manufacturers. The next year brought 323, of which 95 were car makers, and in 1918, 331 were enrolled, of which 79 were cars. In 1919 both the Garden and Palace were used, there being 198 exhibitors, with 56 cars.

In 1920, following the armistice, the N. A. A. M. decided not to hold a national show, so the New York Automobile Dealers' Association staged an exhibition which was truly national in character and which attracted 307 exhibitors, including 81 car makers. The Palace was used for this show. The next year the Chamber resumed show operations in the Palace with 307 exhibitors and repeated in 1922.

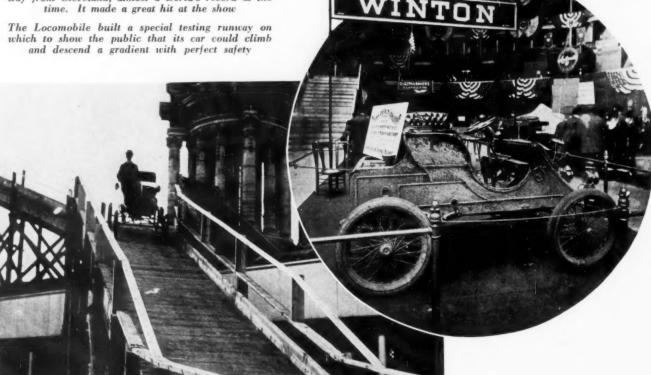
# Me NEWYORK SHOW HISTORY IN PICTURES



# Tricycles Featured 1900 New York Show Held

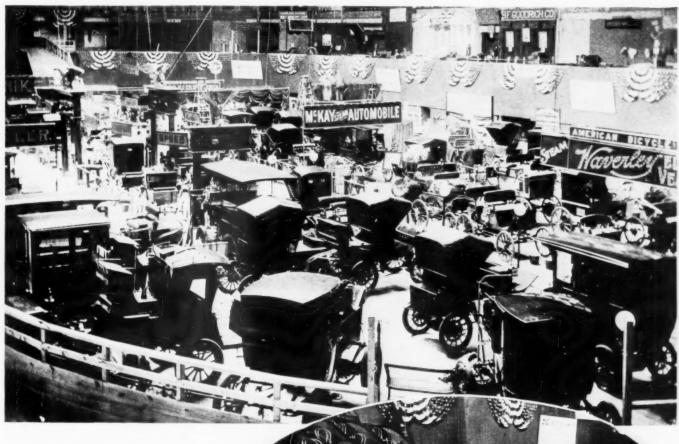


The Winton car, in circle, came over the road all the way from Cleveland, almost a world's record at the time. It made a great hit at the show



The photographs reproduced on these pages were made by N. Lazarnick, who has "covered" the New York Automobile Show every year since its inception

# Under Auspices of Automobile Club of America



When the doors opened Nov. 5, 1900, on the first automobile show held at Madison Square Garden, New York, it was said that never did the opening day of a bicycle or automobile show develop a more pleasing surprise. The show was held under the auspices of the Automobile Club of America and the exhibition furnished the nearest complete collection of cars ever assembled, at that time



Tricycles were popular in those days and as will be seen from the pictures. Demonstrations were carried out on the track. People actually had to be shown that the cars would run and could be steered. MOTOR AGE at the time of the show said, "the exhibition presented an object lesson, learned in a trice, concerning the wideness of the motor-vehicle field, the diversity of its branches, even at this early state of its progress, and the unmeasured possibilities in the way of construction and utility"

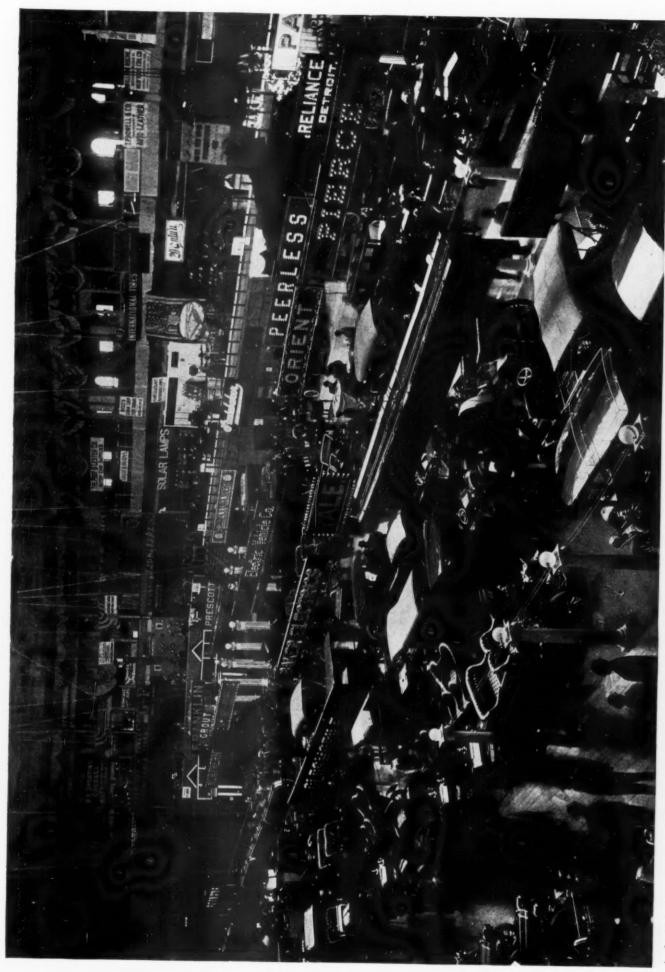


# 1903 Show Marked Epoch in History of Automobiling





The 1903 New York show, like its predecessors, was held at Madison Square Garden, an exterior view of which is shown here. Indications at this show were that it would mark an epoch in the history of automobiling as a sport and as an industry in the country. Also, that it would set the date of the first underiable manifestation of the general acceptance of the automobile as a good, practical and desirable thing by and for the citizens of the United States



At the 1905 show, held at Madison Square Garden, the cars occupied the main floor only, while the balcony was given over to the display of accessories. In those days the show management said nothing of standardized signs as will be noted from the variations in style and size of the signs at the booths. Practically every one used some sort of electric illumination. At this show people talked sizes, cost of operation and control. These were the topics of the day. There were only a dozen or so makers who showed cars with rear doors on the tonneau

# In 1906 They Demonstrated at the Curb

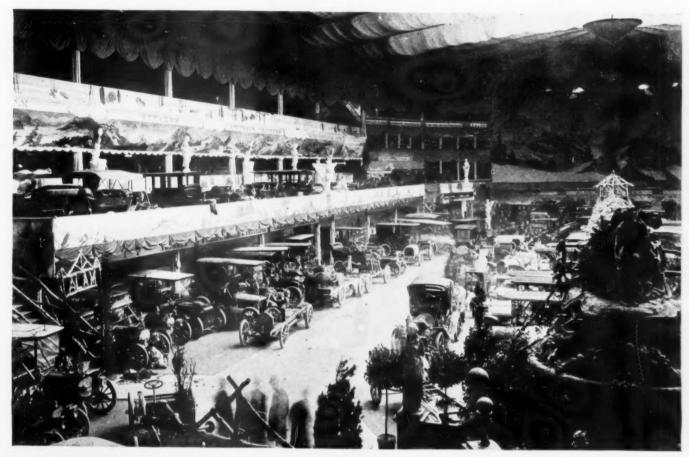


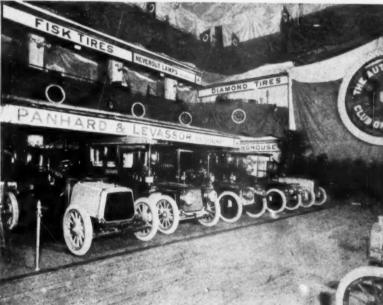
Back in 1906 Madison Square Garden housed the New York automobile show. It was back when there remained a great deal of experimental work to be done on motor vehicles and the public demanded trial runs and demonstrations. The cars lined up at the curb, in bottom picture, show a gallant array of vehicles ready to demonstrate their prowess to an as yet doubting public. This show incidentally marked the introduction of the running board



Here is shown some of the decorative spirit of the 1906 show. The figure holds aloft a model of what was then considered the last word in body design

# 1907 Show Celebrated Amidst Great Pomp



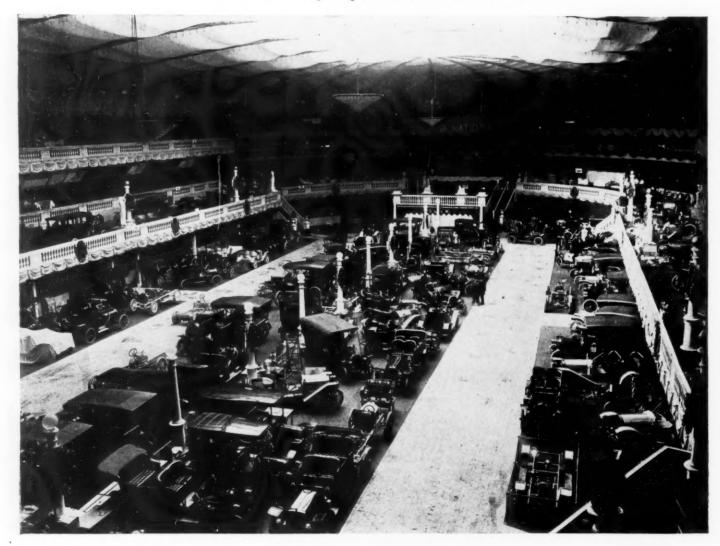


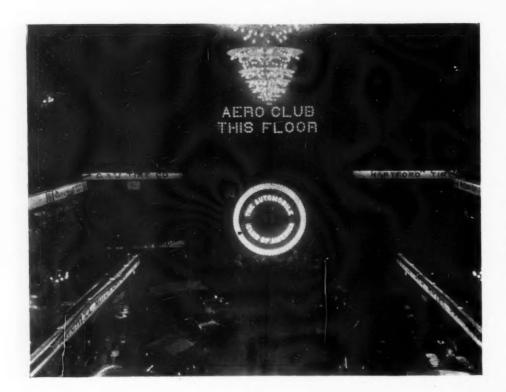
As regards the decorations, the idea was to reproduce a palatial Swiss garden. A cynical visitor, by the way, asked why Switzerland, the most unfriendly country to the motor car, had been called upon to furnish the environment of the show. Even the attendants at the show were garbed in uniforms of Swiss guards

Great pomp characterized the opening of the 1907 show at Madison Square Garden. Ambassadors and foreign diplomatic representatives were brought from Washington to lend social eclat to the occasion. There were no hurrahs at this show as in former years, the licensed makers of cars now boasting of being firmly entrenched in their prosperity



### The Battle of Cylinders in 1908

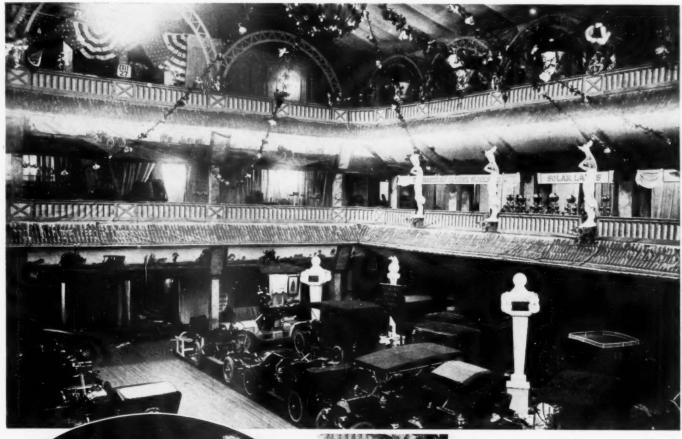




The 1908 show was held in the Fall of 1907 at Madison Square Garden. For the first time the balcony was used to display the cars, as will be noted in the picture at the top. At this particular show the battle of the number of cylinders was going on, the two, four and six-cylinder each having its champions. Hot discussions were also in evidence as to whether we should cool the cylinders by pump or thermo-syphon, whether a shaft drive was superior to chain and similar questions. The tremendous high backs of the seats can be noted in the cars in the foreground. Of special interest was the exhibit of the Automobile Club of

America and the Aero Club

### Two Separate Shows During 1909 Season





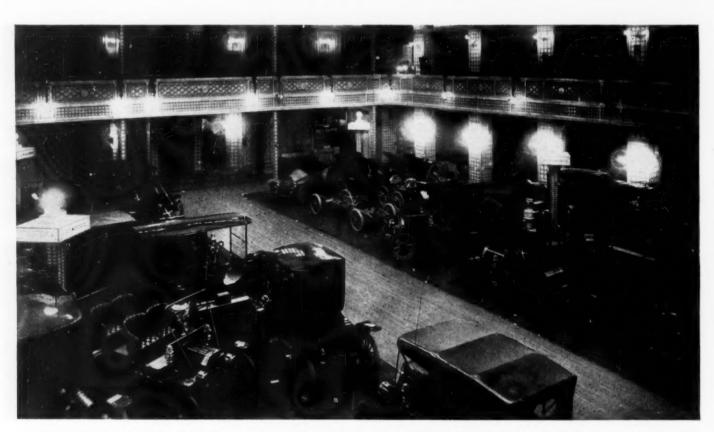
Left, one of the decorations at the Palace show, recalling to many of the old timers the days when Ford was a factor at the automobile shows. By the way, it was about this time that the now famous model T was introduced to the public

Above is shown a general view in the Grand Central Palace, where the 1909 show opened on New Year's Eve. Just a week later the show held under the auspices of the A. L. A. M. opened at the Madison Square Garden. At this particular show the management spread itself on the decorations. The Garden assumed the looks of a Roman amphitheater of dignified architectural design. This background was very striking. In the oval is shown a bit of decoration at the A. M. C. M. A. show



# They Started to Stretch Them Out in 1910





Held both at the Old Grand Central Palace and Madison Square Garden, the 1910 New York show brought forth some interesting developments. For one thing it marked the introduction of the torpedo type of body. In those days it was referred to as a "heavily hooded dash" body. Also, the makers were building their cars with much longer wheelbases. Good body jobs in those days were found in the Lozier, Knox, Palmer-Singer, Marmon, Selden, Fiat, Columbia and others

# In 1911 the Four-Door Body Was the Rage



# Remember the Cold Show of 1912?

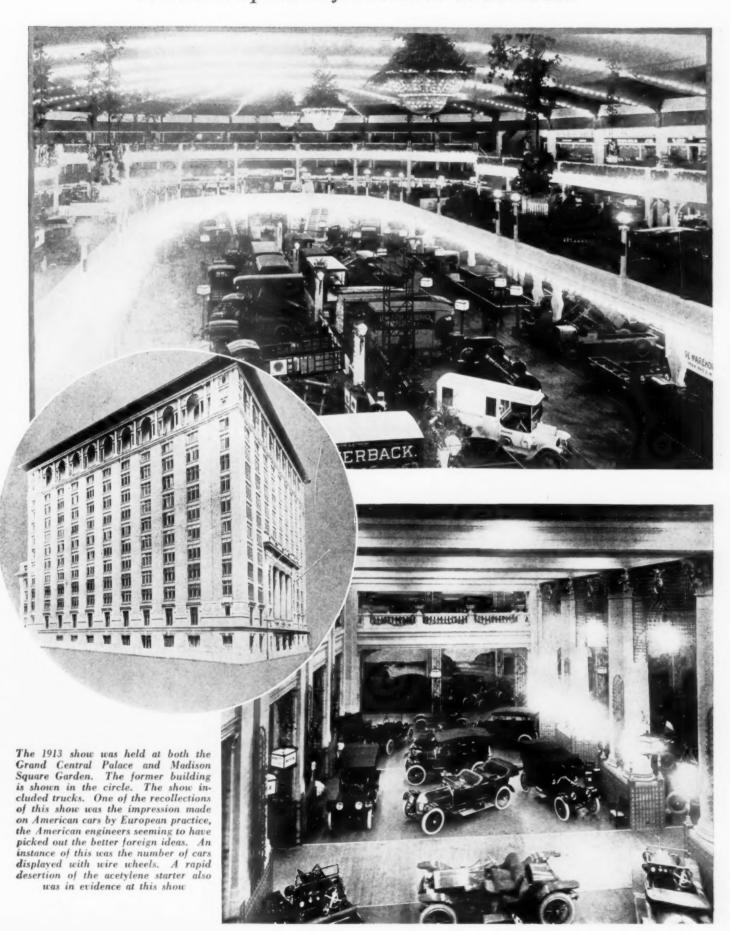




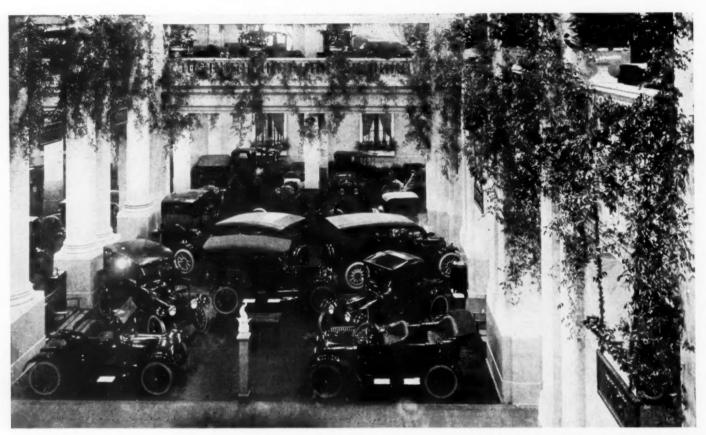
Old timers probably will recall the 1912 show at Madison Square Garden because of the intense cold weather which prevailed. The attendance lacked brilliancy because of the general scurry to overcoats and wraps. The big display of cars with left hand drive was a feature of the show and the self-starters were the major topic of conversation at displays where these were offered as optional equipment.

Electric lighting was in evidence on the higher priced models

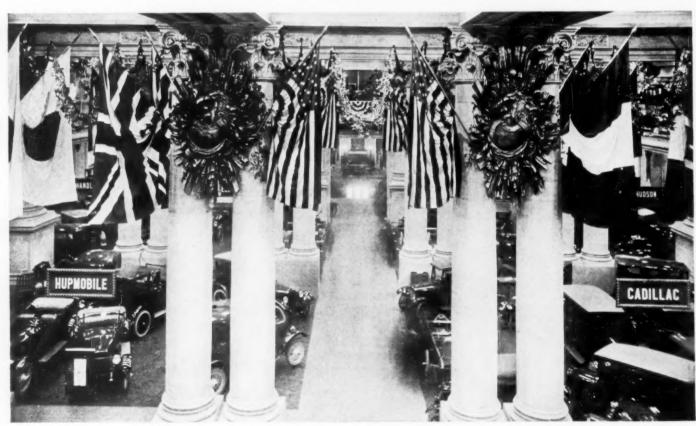
### Some European Influences at 1913 Show



# Electric Engine Starters Featured 1914 Show



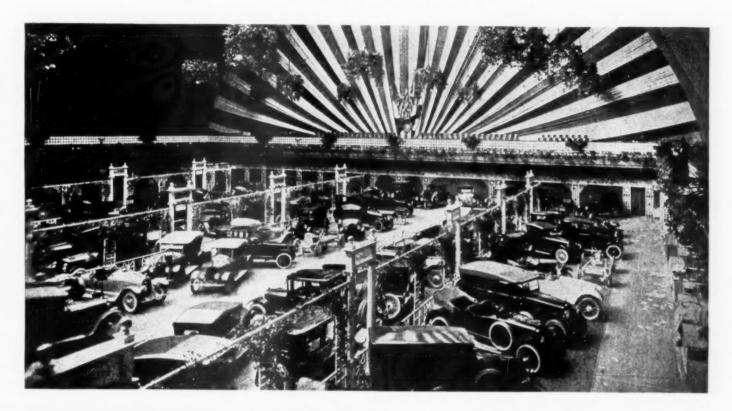
The Grand Central Palace housed the show in 1914 and the thing which will be remembered in connection with this show is the fact that most makers had fitted their cars with an electric starting device

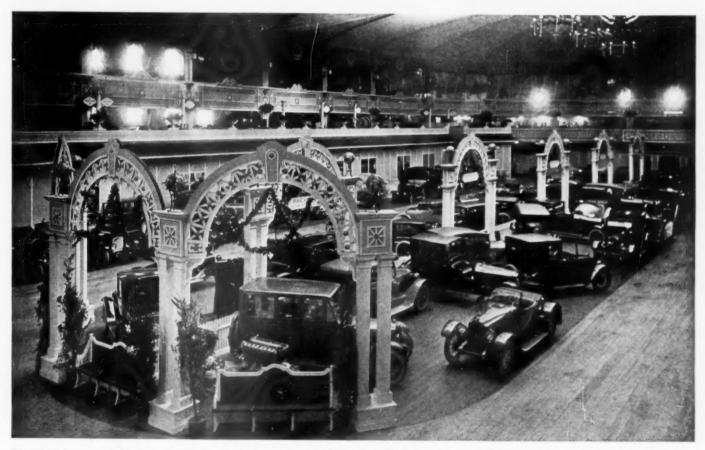


The cars of the 1918 New York show were given a military aspect by the wide use of disk wheels and the straight line effects in the bodies.

There were many who showed roadsters and sport models finished in wartime color ideas such as Mist-o-Marne

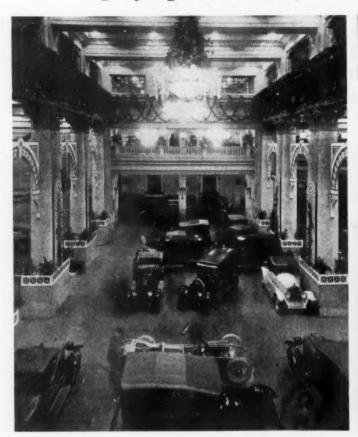
# Bright Colored Cars Feature 1919 Show





The 1919 show was held at the Grand Central Palace and at the Sixty-ninth Regiment Armory. There were no startling changes in designs which had featured the previous years, and the most noteworthy thing at the show was the large number of bright colored cars. The reason for this lay in the fact that once more the makers of this country were able to get pigments

### Mighty Spirit Back of Industry Felt at Recent Shows







One of the features of the 1921 show was the great strides made by the six-cylinder engine. Including the exhibits at three hotels, there were 219 sixes, 100 fours, 38 eights and 3 twelves. More color was in evidence in the bodies and the makers had endeavored to fix up their cars with disk wheels, windshield wings and nickeled radiators

The same holds true of the 1922 show. The enclosed car had made rapid gains, the sedan especially, proving popular with the buying public. The 1922 show was the Twenty-second Annual Show. Going through the show one felt the spirit of the automotive industry and the mighty force which lies back of it—the realization of the predictions made back in 1900 at the first show at the "Garden"

# Majority Favor Earlier National Show Dates

Tabulation of Letters Received in Response to Questions Raised in Motor Age Editorial

#### By CLYDE JENNINGS

AGE discussing the best dates for the national shows. This question was raised in Motor Age in an editorial printed in this magazine Dec. 7. Discussion of the question from the dealer standpoint was asked. There has been quite a liberal response in the way of comment. The letters raise many interesting questions, but of prime interest is the lineup of the various letter writers in the main question at issue. Here they are:

Manufacturers favoring early shows, 58 per cent.

Manufacturers against early shows,

Manufacturers noncommittal, 28 per cent.

Dealers favoring early shows, 63 per cent.

Dealers against early shows, 33 per cent.

Dealers noncommittal, 4 per cent.

Show managers favoring early shows, 50 per cent.

Show managers against early shows, 25 per cent.

Show managers noncommittal, 25 per cent.

Practically all correspondents admit of the importance in recent years of the fall show. Most of those who are not in favor of actually changing the dates of the National Shows, which would naturally swing many of the minor shows in line and arouse the great national interest in the new line of motor vehicles, want to make the fall shows of greater importance in the eyes of the public than they have been in the past, and then come back with another show season beginning after the first of the year. This bid is practically for two show seasons.

This position raises a new question that must be of interest. It is this:

Will the public, who must pay the cost of the automotive shows, stand for two automotive shows?

This is a question entirely apart from any other that has been considered. The automobile shows are the wonders of the industrial show business. They have set the pace in years past and from all appearance are still the leaders in the industrial show world, but for this industry to create two show seasons each year would seem to be a considerable task. It is true that that interest in automotive shows is increasing from year to year and perhaps we should be unafraid and tackle this big job.

Some of the comment in the letters

might be of interest here. It is impossible to quote all of the letters, so some excerpts are given.

Edward S. Jordan, president of the Jordan Motor Car Co., favors the earlier date

A. R. Erskine, president of the Stude-baker Corp., favors retaining the present dates. His reason is that the interest aroused by the shows in the fall would be weakened by the November and December slump and would not be an active force for the spring buying season.

C. A. Morris, Cadillac dealer at Waterloo, Iowa, favors the change because it would revive interest at a time when that interest is slipping. He believes that many of the people from his neighborhood who go to the Chicago show in the fall would come back and buy during the winter.

T. R. Martin, Nash distributor at Atlanta, believes that the show should be in the dullest selling season to avoid a waste of time on the part of the dealer.

J. F. Ransome of Clarksburg, W. Va., says that fall shows would be objectionable in that section because that is the rainy season.

George A. Sherwood, Packard dealer at Bridgeport, Conn., sees a natural change from the mid-winter shows to the earlier shows because the closed cars will be the attraction.

G. V. Orr, manager of the Clemens Automobile Co., Overland distributor at Des Moines, believes that the mid-winter shows are an excellent stimulant for the wholesale trade and he hopes these dates will be continued.

R. E. Lee, secretary and manager of the St. Louis Automobile Dealers' Association, who has had considerable experience with fall shows, favors the winter dates

John L. Raine, manager of the Baltimore Automobile Association, Inc., writes that the dealers of Baltimore and Washington are firm believers in the fall closed car shows and they will continue these regardless of National Show dates. These dealers hold another show in the spring.

D. Underhill-Smith, of the Smith-Sauer Motor Co., Case distributors in Chicago, strongly favor two shows, a closed car show in the fall and another show after the first of the year. The point is made that in very few shows, never in the national shows, is enough space available for display of a complete line.

One manufacturer informs us that the proper place to settle this question is in the directors' meeting of the National

Automobile Chamber of Commerce. We admit that this is not only the place where it should be settled, but it is the place where it will be settled, but we believe that most of the directors of the N. A. C. C. are more or less under the impression that dealers are interested in this question an 1 their views will be of interest if not important. We have no desire to dictate to these directors nor even force a change. This question was raised only with a view of getting a discussion.

One strange note is found in many of these letters: That the show takes much time of the dealer from his business and that the show should be given at a period when the waste would be as little as possible.

Motor Age had always been under the impression that the time given to shows was highly profitable time. Most dealers go into a show to make or at least start sales. If this is not the reason, then the show idea is wrong. If there is any better employment for a man selling automobiles than participating in a show, it is time that this idea developed and was substituted for the shows. Perhaps some dealers need to be sold on the show idea.

It is interesting that not one of these letters discusses the proposition that the Christmas season be made a strong urge in signing the purchase contract. We cannot help but wonder if these dealers have noted the huge amounts that are annually distributed by the Christmas savings clubs.

#### "Modern Motor Car Practice" is Published

"Modern Motor Car Practice" is the name given to a book devoted chiefly to European automobiles, their construction, care and operation. It is edited by W. H. Berry and the various subjects dealing with the many parts of the car were written by well known European engineers.

The book is published by the Oxford University Press, American Branch, and sells for \$10.50. A considerable section of the book is given over to the history of the European internal combustion engine, types of engines, carburetion, cooling, fuel feed systems, fuels, the steam car, clutches, frames and other mechanical detail. Body work is the heading of another chapter.

Still another section is devoted to laws concerning motoring and roads.



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#### THE CLASS JOURNAL COMPANY

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#### The Show Season Is On

EXT week we shall write to you from the New York Show. We hope to be able to a very large extent to bring the show to your office or salesroom by telling you as nearly as we can what you want to know about this great exhibition.

In this issue of MOTOR AGE we have endeavored to outline, as nearly as possible at the advanced date at which the copy had to be prepared, what would be the features of the New York Show. Many of the advertisers have this same topic and so by reading both the editorial and advertising pages, we believe that there will be few genuine surprises for the reader in what is at the first of the 1923 exhibitions. The list of exhibitors in this issue is changed considerably from the first lists published, as these lists have been corrected up to the latest possible

This year we are including a somewhat novel feature in this issue. The automotive industry has now reached an age where it has a history and that history is interesting as well as informative. We are presenting here an illustrated history of the automobile shows, based on the New York Show.

There are many readers of Motor Age who have attended all of the shows and more readers who have

attended most of them and still more readers who wish that they had been able to attend them. For the benefit of these readers, we are presenting a collection of pictures that will serve as a basis for the reader to draft his own story of the progress of the automotive industry.

The success of the employer depends upon the understanding of the employe as to his relationship to the business.—SHERMAN.

#### Tire Resolutions

T IS a little late to talk about resolutions but, perhaps, better late than never. Motor Age has recently offered a number of suggestions to tire manufacturers and to tire dealers. These have been kindly received and some dealers have written to us about their special problems and asked that they be discussed. Now that the tire business is entering on a new year, which we believe will be the most prosperous year that industry has ever known, we offer the following as resolutions for the coming

Manufacturers: We will not, during 1923, spend our efforts in trying to steal the other manufacturer's dealers, but will seek to bring into this business experienced merchants who have proven their worth in other lines, and we will discuss methods of adjustment with these dealers on a practical live-and-let-live basis, realizing that a tire dealer is a human being and that he probably knows something.

Dealers: We will not, during 1923, blame all of our troubles on the factory; we will compile proper lists of owners; we will be always courteous to our customers and we will adjust our repair charges' to the revised shop expense and new tire price scale. Above all, we will not brand our competitor as a fool on the word of every customer who tells us that he is cutting prices. Finally, we will join the Tire Dealers' Association and attend the meetings, if for no other purpose than getting acquainted with our fellow workers.

If these two resolutions could be adopted by the two great factors in the tire industry, we know that the 1923 touring season would see many happy faces greeting tire customers.

Se 3 8

Don't wait until the car breaks down to sell service. -SHERMAN.

28 B 38

### Political Graft

HE automotive dealer should be the natural and intensive enemy of all political and governmental graft, for two primary reasons:

First, we believe that the automotive dealer averages very high in business morals and that anything that savors of graft should be repulsive to him and he should fight waste and loot.

Second, wherever there is governmental looting and waste, an effort will be made to collect at least a large part of this waste from the automotive vehicles of that community. This makes for sales resistance and the dealer should work and strive for honest and economic government as the first step in the promo-

tion of his own business.

Take, for instance, the great amount of road work that is going forward in all sections of the country. Many persons view this road building and maintenance as something done especially for the automotive vehicle. They are wrong, as a matter of fact, for good roads are an asset to any community, regardless of the type of vehicle used, and are merely a greater benefit and economy in the ratio that the automotive vehicle is better than any

other type.

But this view of roadbuilding is here and it cannot be corrected over night. The big thing that should be looked after now is that this work be done honestly and economically. There is a disposition to put all of the road maintenance cost on the automotive vehicle, and perhaps that is as it should be. The objection is that a poorly built road is going to cost so much for maintenance that it will become a burden on the vehicle owner and a sales resistance to the dealer.

The way to correct this situation is for the dealers of any community to interest themselves in this road work by seeing that the routes selected for improvement are routes that will be the most used, that the bids are honestly handled and the contractor a worthy one. Once the road is constructed, the dealer should see that the maintenance work is begun before this road is wrecked by

neglect.

There are many other features of state, county and municipal government that the dealers should watch, as efficient government makes for economical administration, and when an administration is economical there is little temptation for the tax makers to look about for more sources of taxes. Whenever taxes are suggested these days, the next move is to look toward the automotive vehicles as the source of the income.

It must be remembered that in many states the owners of automobiles must pay personal taxes on this property. Frequently the automobile comprises a considerable part of the estate of the taxpayer, and when taxes soar and he remembers that he pays two or three special taxes—a gasoline tax, perhaps two wheel taxes and some other trimmings—he is apt to think that his vehicles are, after all, not worth all of this cost and trouble.

So we suggest that all automotive dealers make themselves active exponents of good government and that they work earnestly at this job, not only at election time, but

by leading opposition to waste and loot.

38 T 38

Flyspecks on the business walls wipe thousands out every year.—Sherman.

28 35 38

#### **Show Invitations**

THIS is the period of the year when invitations are distributed quite liberally by exhibitors at the various shows. The first flood, of course, is for the New York Show, and the others are beginning to appear.

Some of these invitations would go into the joke class if it were not for the very serious consideration of what such publicity costs the firm getting them out. So many of these invitations waste space in seeking to inform the person addressed as to how important this firm is and what an extraordinary position they obtained at this show. Such an invitation presumes that the person receiving the information knows nothing about the method of allotment of show space and that this person is rather dense, in that when he arrives at the show he cannot form his own ideas as to the worth of the location of this particular exhibit.

Another rather amusing feature of these invitations are those persons who refer the recipient to the editorial notices of this product that are going to be printed in the edi-

torial pages of papers and magazines. This sort of a reference is rather unusual. It means either that the exhibitor has bought editorial space and knows that he is going to have such a showing or that he is working "on his nerve." MOTOR AGE wishes to say that any such references to editorial descriptions did not refer to this magazine. MOTOR AGE prints in its editorial pages only such material as the editors think will interest the reader, and never under any circumstances is this space sold, nor are pledges given that even worth-while descriptions will appear at a certain time and occupy so much space.

It appears that a great many manufacturers do not understand the editorial conduct of a paper, probably because they are permitted in certain publications to "buy" a certain amount of space when they buy so much advertising. That is not the way with Motor Age.

雅 堂 彩

Ask 'em to buy. The equipment field offers the greatest undeveloped opportunity in the business.—Sherman.

28 \$ 3K

#### **Electrical Standardization**

OT so long ago, and sometimes even now, we find a motor car salesman who overrates the durability of the product he sells. Listening to some of the selling talks, one might get the idea that most of the units on the car were proof against wear or breakage. With the electrical units on the car, we know that, even with the best of design, construction and materials, replacement of various parts will be needed, and at a fairly definite rate, depending on the service rendered.

For the sake of discussion, however, let us assume that a generator, starting motor or ignition device could be made such that it would never require attention. A bearing would have to be discovered with absolutely no friction. Brushes would have to be developed that would supply the necessary conductivity, but without the slightest wear. Insulating material would have to be found that would never under any circumstances break down, so that in this ideal machine short circuits would be a thing of the past, and would fade from our vocabularies. Under such conditions there would be no need of standardization.

BUT, that day is a long way off, armatures do get shorted, bearings do wear out, and brushes must be replaced. Nor do they give much consideration to the car owner's convenience, but enjoying the privilege of inanimate deviltry, may, like the spoiled child, misbehave at the most inopportune times. If the starter quits, it is when the owner's wife is driving. If the ignition makes up its mind to take a rest, it is when on a vacation trip, on a country road, or in a small town, miles away from the large service station, and its infinite stock of parts. THAT IS WHY STANDARDIZATION IS NEEDED.

Manufacturers may get out manuals and instruction books, such that anyone who runs may read, but he may not run, and is little inclined to read.

Even when the garage man has supplied himself with all the information available on the various electrical systems, it does not mean that he can afford to carry a stock large enough to take care of any electrical job that comes along. A reduction must be made in the number of parts that must be carried, to furnish adequate service.

The only way this can be accomplished is by having fewer types, and some standardization in the size of parts where dimensions have but little to do with the way in which the machine functions.

# Year's Production Exceeds 2,500,000

#### December Output Not Far Below That of November

#### Buying Interest Carries Over the Christmas Season in Unprecedented Volume

NEW YORK, Jan. 2—The inventory period in the majority of plants in the industry will come to an end this week with far less than the usual interruption in manufacturing activities. Pressure of orders has made continued operations necessary in many factories with an actual shutdown taking place only toward the end of the month and then for but two or three days.

This has enabled manufacturers to take steps toward catching up on back orders and to avail themselves of the improvement in the enclosed body situation. Top-speed operations at body plants has been of material aid to car builders, but despite the improvement that has come, the body shortage is still a serious problem which will not be solved completely until additional facilities now being provided are available.

Owing to the necessary curtailment of production programs the latter part of the month, December will show a falling off from that of November, but reports indicate that the decline will not assume large proportions and will not interfere with the original estimate of 2,500,000 cars and trucks for the year. In establishing a record for that month the industry rounds out a year of surprises.

Buying interest carried over the Christmas season in unprecedented volume and will receive a fresh stimulus from the announcement of new models at the New York show. While some manufacturers have prepared schedules for 1923, many have waited to shape their programs until the show season was launched and inventory taking cleared away.

Rail movements have shown some improvement, thus effecting a prompter delivery of finished products and making unnecessary as extensive a use of motor trucks as formerly in shipping materials from producing centers to automobile manufacturing zones. The generally mild winter has been of substantial benefit to the traffic end of the industry.

This month will find a greater movement of open cars to dealers in anticipation of spring demand. Such shipping facilities as have been available in the last few months have been used for the most part to send closed models forward, with the result that there has been little stocking up of either closed or open cars. Plant operations, also, have been centering around the closed model in view of its unexpectedly sudden leap to popularity.

An active demand for the lighter duty truck is reported with a prospective in-

crease in the sale of the heavier vehicle as the year advances. Due to the trend toward motor buses throughout the country, manufacture of this type of vehicle is playing an important part in the truck branch of the industry and makers show a growing disposition to arrange manufacturing programs to admit of their production in greater quantities.

# Advertising Managers to Meet in Chicago During Show Week

NEW YORK, Dec. 31—Advertising managers allied with companies which are members of the National Automobile Chamber of Commerce and the Motor and Accessory Manufacturers' Association, will have their innings at the Chicago show, each of the associations having scheduled a meeting during the week of the big affair.

The National Automobile Chamber of Commerce will hold a two-day session, having selected Jan. 29-30 as dates, with the meetings probably at the University Club. The sessions will be presided over by Chairman E. S. Jordan and the topics for discussion will be selected by ballot, each advertising manager having been asked to name a topic he would like to hear talked on.

The Advertising Managers' Council of the Motor and Accessory Manufacturers' Association will hold its meeting Jan. 31. Chairman Ezra W. Clark announces the central theme of the conference to be, "How Can the Parts and Accessory Manufacturers Assist in the Development of the 'Fully Equipped' Car and Truck Market?" A leading car manufacturer will be on the program, as will executives and advertising managers representing the principal basic units and parts of the automobile, as well as general accessory lines.

#### HUPP PRICES REDUCED

DETROIT, Jan. 2—New Hupmobile prices effective at once are announced by the Hupp Motor Car Corp. There is a reduction of \$110 on the sedan, \$35 on the open models and \$100 on the four-passenger coupe. The new list follows:

10 110.	na price	New pric
Phaeton	\$1150	\$1115
Roadster	. 1150	1115
Special Touring	1250	1215
Special Roadster	. 1250	1215
New 2-pass. Coupe		1385
4-pass. Coupe	. 1635	1535
Sedan	1785	1675

#### BUICK NOT TO CLOSE

FLINT, Mich., Dec. 30—For the first time the Buick Motor Co. will not close its plant for the annual December inventory. President Bassett declares that there is no let-up in the volume of orders for immediate delivery and because of this it is impossible to close the works. December, he says, will be another record month.

#### Total November Production Is 235,854 Cars and Trucks

#### Revised Figures Collected by U. S. Department of Commerce Are Announced

WASHINGTON, Dec. 30—Reports from the Department of Commerce through the Bureau of Census in cooperation with the National Automobile Chamber of Commerce, show total production of cars and trucks for November of this year to be 235,854.

The following table gives the total production for each of the last five months, with corresponding figures for the same months of last year.

With a few exceptions, the reports each month are from identical firms and include approximately 90 passenger car and 80 truck manufacturers:

Passenger Cars-	1922	1921
July	224,770	165,574
August	248,484	167,705
September	187,964	144,669
October		134,734
November Trucks— July		106,042
		10,766
August	24,394	13,080
September	19,130	13,648
October	21,434	12,813
November	21,223	10,010

#### Equipment Sales \$150,524,508 More Than This Time Last Year

NEW YORK, Dec. 31—Reports of the Motor and Accessory Manufacturers' Association show that sales of equipment and parts in November, 1922, decreased 5.51 per cent over the preceding month and that for the first 11 months of this year the total sales amounted to \$384,-226,070, or \$150,524,508 more than for the corresponding period of 1921.

The following table shows the sales by members of the association for all the months of 1921 and the first 11 months of 1922:

1921	1922
6,264,587	\$17,320,000
10,408,962	22,720,000
20,120,386	28,670,000
26,746,580	33,830,000
26,781,350	43,700,000
22,703,414	42,000,000
23,096,214	41,001,670
23,397,640	43,700,000
23,141,891	37,300,050
22,053,327	38,753,800
18,998,490	36,616,850
14,349,750	*************
	6,264,587 10,408,962 20,120,386 26,746,580 22,703,414 23,096,214 23,397,640 23,141,891 22,053,327 18,998,490

#### RICHMOND SHOW IN MARCH

RICHMOND, Va., Jan. 2—James H. Kline, president of the Richmond Automotive Trade Association, announces that the annual automobile show given by the local association will be held March 10 to 17. Besides new models of automobiles, accessories and attachments will be shown.

# Tire Prices Generally Increased

#### Boston Dealers Have Best December; Outlook Promising

Many Have Orders Already for Spring Delivery; Shows to Help

BOSTON, Dec. 30—Boston motor car dealers, and that means many others in the New England territory, are very optimistic over the prospects for the new year. Business during December kept up remarkably well. Ordinarily there is a slump in August and again during the weeks just preceding Christmas. This year there was no August slump. And there was no dullness in December. A number of dealers say that this December was the best they ever experienced. Now they are looking forward to the shows to help them out with a lot more orders.

Many of the Boston dealers have orders for Spring delivery. This is due to the tax law that allows owners to escape taxation on machines if they do not possess them on April 1. But there is a bill being prepared by the legislature to try to remedy this, and the dealers feel that it is worth supporting, because then people would take their cars whenever they arrived in the Spring.

There has been some talk, not very pronounced, that it would not be a bad idea to have a motor show in Boston about the first of February.

#### States Refusing Reciprocity Won't Get Federal Road Aid

WASHINGTON, Jan. 3—Automobile reciprocity between Maryland and other states, including the District of Columbia, which has been a continuous fight since the inception of the automobile is to be forced by Congress under a rider in the \$29,000,000 agricultural appropriation bill for state aid in road building, which will withhold the expenditure of any Federal funds in that state until reciprocity is granted.

Refusal of Maryland to grant the district reciprocity is costing motorists in the district approximately \$1,350,000 annually. Other states which have refused to grant automobilists reciprocity, members of the Senate subcommittee of the finance committee declare, are to be "got in line" by the same methods.

The rider in the bill is being fostered by the A. A. A. and the National Motorist Association, in the interest of wider use of the automobile and courtesy to tourists.

#### OLDSMOBILE DEALERS TO MEET

LANSING, Mich., Jan. 2—The annual dinner of Eastern Oldsmobile dealers will be held Wednesday evening, Jan. 10, in the west ballroom of the Hotel Commodore in New York City. Speakers will include A. B. C. Hardy, president and general manager of the Olds Motor Works; Guy Peasley, general sales manager; C. H. Larson, president of the Oldsmobile company of New York, and C. F. Kettering, president of the General Motors Research Laboratories.

#### Prize Winning Show Poster



The Philadelphia Auto Trade Association recently offered a prize of \$100 for the best design for a poster to advertise the twenty-second annual automobile show to be held under its auspices Jan. 13 to 20. The design illustrated here was awarded the prize.

#### Saxon Cars Not to Be at the National Shows, Receiver Says

DETROIT, Jan. 2—There will be no showing of Saxon cars at the national shows this year, according to David C. Bayne, secretary and treasurer of the Saxon Motor Car Co., who was named receiver following the filing of bankruptcy petitions. Preparations are being made for the sale of the company as soon as a favorable opportunity presents, and there is possibility that the company will continue as a car manufacturing company.

Harry L. Bill, vice-president and general manager of the company, is working with Bayne in winding up the affairs of the company. James S. Becker, formerly sales manager of the company, has joined the Hudson-Essex distributing organization in Atlanta, as general manager.

#### Akron Makers Revise Lists Upward to 15 Per Cent

Firestone, However, Announces No Increase Contemplated for Near Future

AKRON, O., Jan. 2.—The long expected break in the tire price situation in the Akron tire producing district came on Saturday, Dec. 30, when the B. F. Goodrich Co. put price advances ranging from 10 to 15 per cent into immediate effect, following the lead taken outside of the Akron area by the Fisk, Kelly-3pring-field and United States Tire & Rubber companies.

Practically all other tire producing companies in the Akron center followed the Goodrich lead, with the two major exceptions of the Firestone Tire & Rubber Co. and the Goodyear Tire & Rubber Co.

Goodyear refrained from making any announcement until after Jan. 2, although admittedly is planning to advance prices commensurately with the Goodrich increases. Firestone officials reiterate the statement of President Harvey Firestone, made at the stockholders' annual meeting the middle of December, that "We have no intention of increasing prices in the immediate future."

#### No Goodyear Announcement

Vice-President G. M. Stadleman of Goodyear, when informed of the Goodrich action, merely said, "We have no announcement to make now."

The General Tire & Rubber Co., Miller Rubber Co., Mohawk Rubber Co., American Hard Rubber Co., Seiberling Rubber Co., Star Rubber Co., and the Marathon Company all announced increases commensurate with those of Goodrich, but did not announce dates when the new prices would become effective. All, however, said the new lists would be ready for enforcement of the new schedules by Jan. 3 or 4.

The India Tire & Rubber Co. increases prices from 12 to 14 per cent, effective Dec. 30, and the Swinehart Tire & Rubber Co. also put an average increase of 12½ per cent into effect the same day.

The Mason Tire & Rubber Co. of Kent, which advanced tire prices 5 per cent on Nov. 15, announced that a second advance, ranging from 9 to 12 per cent, would be effective Jan. 15.

The Goodrich increases range from 10 to 15 per cent, averaging about 12½ per cent, on all lines of automobile tires. Prices are to be advanced on pneumatic and solid truck tires, also.

"We will increase tire prices from 10 to 15 per cent, but we cannot now commit ourselves as to exactly when the new schedules will become operative. It will probably be a few days after New

(Continued on next page)

#### Akron Makers Revise Lists Upward to 15 Per Cent

#### Firestone, However, Announces No Increase Contemplated for Near Future

(Continued from page 53)

Years," said Sales Manager F. C. Milhoff of the Miller Rubber Co.

"We are ready to fall into line as soon as we can draft our new schedules," announced Vice-President William O'Neil of the General Tire & Rubber Co.

"We are just closing the biggest year in our history and look for a bigger year in 1923. Production is running 500 casings a day. Our new prices go into effect about Jan. 3 or 4," announced President L. H. Firey of the Star Rubber Co.

"We will increase prices about 12½ per cent early next week. Business could not be better. Spring orders are unusually heavy and we are now running 600 tires daily," stated officials of the Marathon Co.

#### Advance in Tubes Expected

A general advance in tube prices also is expected. Goodrich increased tube prices 10 and 15 per cent three weeks ago.

On this basis of 1922 production of automobile tires, the new prices which start off the new year will mean an increase in revenues to tire manufacturers in 1923 of from \$25,000,000 to \$50,000,000. During 1921 and early in 1922 prices on tires were slashed, the reductions approximating about 40 per cent and taking tire prices down to the lowest levels in history. Manufacturers estimate these cuts represented a diminishing in sales revenues to them for 1922 of nearly \$70,000,000.

In the Akron district, the 22 rubber companies are capitalized at \$345,834,000. Gross sales of these 22 companies for the year were about \$266,935,296. In 1910 the capitalization of these companies aggregated \$309,037,000 and sales were \$544,729,000.

Although sales revenues were considerably less for 1922 than 1921, unit production was higher, the diminished sales revenues being attributed to the lower tire prices. Sales in 1921 were \$328,766,000 as compared to \$266,935,296 for 1922.

Akron tire manufacturers are sanely optimistic. They do not believe there is a big boom "just around the corner," but they do predict a steady period of increased sales and prosperity. Nearly all companies today have on their books for spring delivery about 50 per cent more business than they had listed a year ago, and it is considered probable that all companies will increase their factory forces early in the year and boost production from the present mark of about 90,000 casings a day, to perhaps as high as 125,000 daily.

# Santa Claus Leads Procession of 38 Cars Destined for Xmas Stockings in Detroit

DETROIT, Dec. 30—Santa Claus put in several busy hours in Detroit Christmas Eve getting his Hupmobiles lined up for distribution to happy persons here who were destined to have their wishes in this particular direction come true. A driveaway of 38 cars, most of them enclosed, was staged from the factory and from the salesrooms of Williams & Hastings, distributors, through the principal streets of the city before they were speeded away—toward the 38 chimneys they would have to negotiate.

they were speeded away—toward the 38 chimneys they would have to negotiate.

Each of the cars bore the name of the person who was to be the recipient of a gift Hupmobile, with the Christmas greeting of the donor. In a car preceding the parade rode Santa Claus (perfectly at home because he was really a Hupp salesman), and in the first gift automobile of the procession rode E. S. Poppleton, high Hupp salesman for the city, who was the guest of honor.

for the city, who was the guest of honor.

R. H. Williams, president, Don S. Hastings, vice-president and general manager, and Stan E. Comstock, general sales manager of Williams & Hastings, with representatives of the Hupp Motor Car Co., also rode in the parade, as did representatives of each of the Hupp sub-dealers in the city. At the City Hall the parade was greeted by the mayor and other city officials before its dispersal.

A special Hupp roadster was loaded to the "gunnels" with candy which Santa Claus threw to all the good little boys and girls along the line of march, thereby making Hupp prospects of them for a little later on.

#### VIRGINIA TO FIGHT FOR ROADS

RICHMOND, Va., Jan. 2—Following an appeal to 160,000 automobile owners in Virginia sent out by the Virginia Automobile Association to pay their poll tax and prepare to fight at the polls for good roads in Virginia, Gov. E. Lee Trinkle has issued a call for a special session of the Virginia General Assembly to act on the road problem. The session has been called for Feb. 28, when the bond issue forces and the anti-bond issue forces will meet.

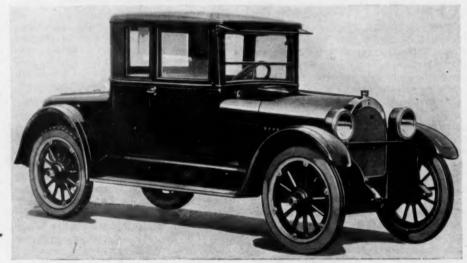
Bond issue opponents will present a bill calling for a 2-cent, or possibly, as advocated by State Highway Commission Chairman Henry G. Shirley, a 3-cent gasoline tax, to be used for road construction. Bond issue proponents will present a bill for a gas tax, proceeds from which will go into a sinking fund to retire from \$12,000,000 to \$20,000,000 in bonds which they will fight to have authorized for immediate road construction work.

#### KALAMAZOO DEALERS ORGANIZE

KALAMAZOO, Mich., Dec. 30—The Kalamazoo Automobile Trade Association, an organization based on the stability, character and financial responsibility of its members, has been formed in this city, succeeding the Kalamazoo Automobile Dealers' Association, which has automatically ceased to exist.

The officers of the new association are: President, R. E. Fair; vice-president, H. B. Parker; secretary-treasurer, Otis J. Boylan. The membership includes the 15 local retail concerns.

### Oldsmobile to Show Two-Passenger Cab



Olds Motor Works will show a cab, a new enclosed two-passenger model, on the four-cylinder chassis, which will sell at \$1195 f.o.b. Lansing, at the New York and Chicago shows. The seat is 43 in., doors 25 in. and the cab height 46 in. It will be finished in blue with gold striping. Upholstery will be grey Spanish leather and inside top lining taupe

velour. Plate glass is used throughout and there is a roll curtain for the rear window.

Standard equipment includes transmission lock, cowl ventilator, windshield wiper and visor, dome light, drum headlights, cowl lights, double windshield. Rear luggage compartment contains 12 cubic feet and compartment back of front seat 3 cubic feet.

#### 18,000 New Cars Sold in Cleveland During 1922

#### Record Month's Business in October When Sales Were 3000—Good Outlook for 1923

CLEVELAND, Jan. 2—A review of business done last year in this city by automobile dealers discloses that at least 18,000 new automobiles were sold in this city in the last 12 months.

The estimate of the number of sales is made by Herbert Buckman, manager for the Cleveland Automobile Manufacturers and Dealers' Association.

One of the most striking features about the volume was the sales made in October, when 3,000 cars were purchased in this city. That is a record that never before was equaled. In November the sales totaled 2,500 new cars. These two months are considered the slack period of the year. December sales have not been tabulated, but dealers report business has been good.

Buckman's prophecy for the future is that with industrial conditions throughout the country fairly well stabilized and such a good year reported in the automotive trade, it is only natural that the industry should look for a bigger year. That they do so is shown by the interest manufacturers and dealers have taken in Cleveland's approaching twenty-second annual show, which is to be held in the public auditorium and central armory on Jan. 20 to 27.

Another development in the automotive industry in Cleveland in 1922 is the return to normal of trade in trucks and other commercial vehicles. Truck and tractor men have indicated their feelings toward 1923 by buying early space for the truck and tractor show.

#### Bill to Bond Motorists Is Introduced in U. S. Senate

WASHINGTON, Jan. 3—What is regarded as probably the most drastic effort ever made to regulate automobile users has been undertaken in the Senate by a bill introduced by Senator L. Heisler Ball of Delaware, requiring every automobile owner and operator to be bonded in the amount of \$3,000 in the District of Columbia.

The bill was introduced on Dec. 29, and under its provisions it is intended primarily to indemnify life and property from destruction. Strong protest against the "entering wedge" of such legislation directed toward the automobilist has been made by representatives of the A. A., N. M. A. and other automobile organizations.

#### EMBLEMS FREED OF TAX

WASHINGTON, Jan. 1 — Emblems, such as those used by the A. A. A. and the National Motorists' Association, on radiators of automobiles, heretofore classified as automobile accessories, have been taken out of that category by a

new ruling of the Internal Revenue Bureau, following the raising of the question by the Legislative Board of the N. M. A. While the individual tax was small, the aggregate, according to figures submitted, showed that something like \$6,000 annually was collected by the government in this form of taxation.

#### Oakland Working on Schedule of 175 Cars Daily for 1923

PONTIAC, Mich., Jan. 2—"We expect 1923 to be the best year in the history of the Oakland Motor Car Co.," says W. R. Tracy, assistant general sales manager of that concern. "In fact, we expect to see more automobiles of all kinds sold this year than ever before. Every concern making a good car, justly priced, can expect to do real business, in our belief, after a survey of the situation."

The Oakland company, Tracy said, will start at once on a capacity schedule of production. The inventory period was shortened and men were summoned back to the plant starting with Tuesday, Jan. 2. They will begin at once on an output of 175 cars daily. Of these the bulk at present will be enclosed jobs, but the demand for open cars is also holding up remarkably well, it is claimed.

#### CALIFORNIA MEETING CHANGED

OAKLAND, Cal., Jan. 2—The northern division meeting of the California Automobile Trade Association, which was scheduled for Santa Rosa in February, has been changed to Oakland. The dates announced by Secretary-Manager Robert W. Martland, are Feb. 26 and 27.

#### PERSONAL INTEREST IN CUSTOMERS

A bunch of friends is better than a card index to the Crist Motor Co., Shenandoah, Ia., when it comes to keeping a line on prospects. The company employs four salesmen who are on the road constantly making a house-to-house canvass of the company's territory. Every man has instructions to keep in touch with the customers the company has in his particular territory and to try to do something for them. In other words, Crist says "the company goes out of its way to do favors, thus putting as many men as possible under obligation to it."

This means taking a personal interest in any automotive equipment the company may have sold to the farmer, be that a car, a truck or a tractor. By spending a few moments talking with the farmer about his equipment, or by making those little minor adjustments which all such equipment needs once in a while, every piece of equipment is kept in good running order and up to its highest efficiency all of the time. This takes only a few moments of the salesman's time, and there is no idea of free service involved; it is merely a kindly, accommodating personal interest, which the customer appreciates and which keeps him satisfied and a booster for the company.

#### Compulsory Insurance for Automobilists Is Proposed

Bills to Be Introduced in at Least Four States—Other Legislatures Interested

NEW YORK, aJn. 2—Compulsory insurance, it is believed, will be one of the phases of automobile legislation that will be attempted this year when 43 state legislatures meet. Many signs point to this, and in at least four of the commonwealths have taken steps in that direction. While it is not definitely known, it is suspected that there are other states which are waiting only for some state to take the lead before bringing up the subject.

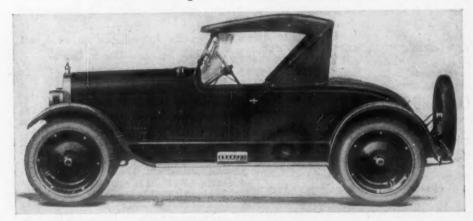
New York, Pennsylvania, and Massachusetts already have gone into the matter deeply and it is said that without a doubt the subject will come up, while another state, Nebraska, has indicated that it is gathering data that can be used as a basis for a bill to introduce into its legislature. Massachusetts has taken definite action through the filing of a bill by Senator-elect Abbott B. Rice to require general liability insurance of motor vehicle owners.

The Massachusetts bill is patterned after a New York measure fathered by State Senator S. W. Straus, Jr., and drafted by Miles Dawson, who wrote the workmen's compensation act. It provides that a person injured by an automobile or his dependents would be entitled to receive indemnity from the state fund, whether the car was registered in Massachusetts or in another state, while Massachusetts owners will be insured against liability arising from accidents occurring in the Bay State, as well as in any other state which should enact a similar law. The amounts of indemnity have a basis similar to that of the Workmen's Compensation Law. The maximum for death is \$6,400 and for incapacity \$4,000, while the minimum payments specified are 1,000 for death, \$8 a week for total incapacity and \$5 a week for partial incapacity, besides medical attendance and certain specified sums for loss of limb. It is further provided that an injured person or his dependants would receive weekly payments unless the board deemed it advisable to pay a lump sum, and he could not assign payment nor could it be attached for debt.

#### SPRINGFIELD (ILL.) DEALERS ELECT

SPRINGFIELD, Ill., Jan. 1—At the annual meeting of the Springfield Automobile Dealers' Association, new officers were elected for the coming year as follows: President, R. E. Haas; vice-president, J. D. Elliot; secretary, W. F. Dagon treasurer, C. R. Constant; directors, R. E. Hatcher and Ross Rummel. Plans were discussed for the coming show of cars to be given at the state arsenal building the second week of February.

### Oakland Sport Roadster at \$1145



One 1923 Oakland six sport roadster exhibited at the New York show for the first time

The Oakland Motor Car Co. has added a sport roadster to its line, which will be exhibited for the first time at the New York show. It is mounted on the standard chassis and is painted a light maroon upholstered in brown Spanish leather. The equipment includes drum headlights, nickel plated with cowl and tail lamps to match. Also included in the equipment on this car is a heavy nickeled radiator with special radiator cross-bar cap and motometer. The

equipment includes nickel bars in rear, a plate wind reflectors, rear view mirror and running board step mats.

Disk wheels with demountable rims are used. The instrument board is walnut and glass covered and the instruments are silver faced. There is a leather bound khaki top and khaki covered windshield visor. This model is in addition to the regular roadster, which will be continued, and the sport touring. The new model sells for \$1145 f.o.b. Pontiac.

#### Truck Is Ideal Measure of Our Transportation—Barnes

WASHINGTON, Dec. 30—The motor truck is the ideal measure of American transportation, according to Julius H. Barnes, president of the United States Chamber of Commerce, addressing members of civic trade bodies and clubs via radio, throughout the United States, at the annual banquet of the Washington City Club.

The speaker declared that while the problem of transportation should predominate the minds of all thinking Americans, that no definite plans were under way to solve it. The motor truck, Barnes asserted, was the ideal method and would be the salvation, in the end, of the country's general transportation problem; which, he said, was the most vital question before the American public.

#### SPEEDING UP ENGINE PRODUCTION

PONTIAC, Mich., Jan. 1—The Wilson Foundry and Machine Co, producing engines for the Willys-Overland Co., was compelled to reduce its two weeks' inventory period to two days in order to keep going on the project of establishing a reserve of engines and parts before entering on the 1923 schedule of

The new Knight engine shop has started off at once on a schedule of 150 to 175 engines a day, which was the capacity of the plant a few months ago, before re-arrangements were made with a view to getting production of 300 daily.

#### FILLING STATIONS OPPOSED

BRIDGEPORT, Conn., Dec. 30-That gasoline filling stations are likely to be considered detrimental to adjoining property values is indicated in the storm of protest that has arisen from property owners along Connecticut avenue, which has resulted in the Sunfield Oil Company withdrawing its petition to establish a station at Connecticut and Union avenues, along a much traveled highway between New York and New England points. Not only have property owners claimed that the establishment of the station would decrease nearby property values, but that establishment of the station at this junction would endanger the lives of scores of school children. The application had been approved by Mayor Atwater and the Common Council. Policeman P. J. Maloney, owner of adjoining property, characterized the approval as tending to make Bridgeport a "tank town" and Connecticut avenue, a main thoroughfare, a "gasoline alley."

#### 750 GMC TRUCKS A MONTH

PONTIAC, Mich., Jan. 1—"Big production of motor trucks, both in heavy duty and lighter models, is marked out for the General Motors Truck plant," said W. L. Day, general manager, today. "The December business of the concern has been about the most remarkable we have ever known. This is not ordinarily a time for big business houses to buy trucks. Usually they evade it if possible and wait for the end of their fiscal year. But we have been getting a record number of orders, especially for heavy duties, and even in fleets. The sales record for December has been remarkable.

### Important Topics for 1923 N.A.D.A. Convention Program

#### Cost of Doing Business and Used Car Problems to Be Discussed by Experts

ST. LOUIS, Jan. 2-First returns from a survey on the "cost of doing business" in the retailing of automobiles, are in process of compilation by the National Automobile Dealers' Association, which is conducting a brief research on this subject. "Cost of doing business" will be the subject of a discussion by Richard Lennihan, Assistant Director of the Harvard Bureau of Business Administration, as one of the outstanding features of the 1923 convention of the National Automobile Dealers' Association in Chicago, Jan. 27-30, inclusive. Results from the first returns in the survey probably will be made known to members of the National Association just prior to the convention.

#### Comparative Costs Shown

The figures now being obtained, it is said, will give some idea of the costs in the automobile business as compared to the costs of doing business in other fields. Lennihan will have at his disposal for discussing this subject the facts established by the Harvard Bureau in its study of the wholesale grocery business, department stores, retail jewelry and retail shoe business.

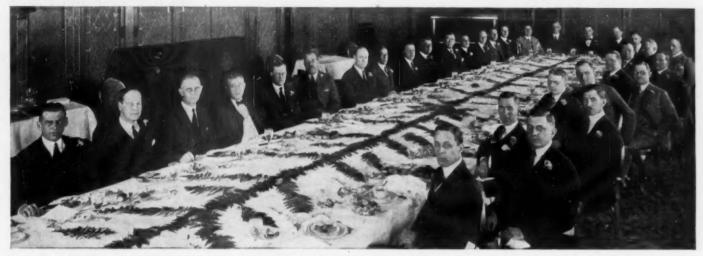
All of those businesses were studied on the basis of their records for 1921. For eleven years the Bureau has been carrying on a systematic study in the retail shoe trade. This study has shown a steady increase in the accuracy of accounting in this business and a steadily widening influence on methods that have much to do with the fixing of overhead costs in the business.

The program also will include an address by Harry Tipper of the Class Journal Co., on "Future Tendencies in Automobile Merchandising."

#### The Used Car Question

The used car question will receive its share of attention, from such angles as the methods of regulation, statistics of losses suffered by individual dealers and methods of merchandising. The used car and its handling, from an association standpoint, will be discussed by Guy S. Garber, president of the Garber-Buick Co., of Saginaw, Mich. The economics of used car losses, proper buying and proper resale principles will be discussed by L. B. Sanders of the Dunbar-Sanders Co., of Boston, who is also manager of the Boston Statistical Bureau operated by the Boston automobile dealers. The merchandising of used cars will be discussed by W. Pitt Barnes, president of the W. Pitt Barnes Co., Dodge dealer in Cleveland.

### "Automotive Equipment Associates" at First Luncheon



Automotive Equipment Associates, a body of men representing various manufacturers in the automotive field, was organized at Chicago during the A. E. A. Convention in November. The purpose of the organization is to "pool" advertising for educational campaigning

#### Optimism Is Keynote of the Atlanta Dealers' Annual Meet

#### Officers Elected; Increase in Agricultural Prices Boosts Business

ATLANTA, Ga., Dec. 30-Optimism over the 1923 outlook for the automobile industry in Atlanta and the Southeast was the keynote of the annual meeting of the Atlanta Automobile Association, held Dec. 20, with practically a full attendance of the membership. Most dealers present stated volume of sales the past three months has been the largest they have ever experienced, while accessory wholesalers advised the year 1922 was the best they have yet enjoyed. The remarkable increase in agricultural prices in the South has greatly increased rural car, truck and accessory sales, and distributors look for the first half of 1923 to be unusually good.

Floyd W. Northcutt, retail sales manager of the John M. Smith Co., Buick dealers, was elected president for the coming year to succeed D. C. Black, who is also a Buick dealer. Other officers named were Samuel C. Porter, first vice-president; W. R. C. Smith, second vice-president; F. G. Tegder, third vice-president; R. F. Stuart, secretary; C. V. Hohenstein, executive secretary; R. A. Parker, treasurer. New directors named were J. H. Sommers, John E. Yarbrough and Lon Credelle.

Retiring President Black was presented with a silver loving cup as a token of appreciation for his work the past year in behalf of the industry in Atlanta.

Announcement was made by R. H. Martin, chairman of the space committee of the 1923 automobile show, that all space for passenger cars has been disposd of and preparations are being made to build a mazzanine balcony to provide several thousand additional feet.

#### WILLS STE. CLAIRE AT SHOWS

DETROIT, Dec. 30—C. H. Wills & Co. will exhibit new models at the New York and Chicago shows, in both enclosed and open styles. The new models involve changes in both chassis and bodies. The company has not stated whether the new models will sell at prices differing from former models in its line and is withholding all details pending the completion of the appraisal for the receiver which will be concluded this week.

The company is planning an extensive enclosed car business in 1923 and expects this to reach higher than 50 per cent of all cars sold. Outlook for business in the new year is considered very good and the company is preparing to resume normal production soon after the first of the year.

#### FORD GETS TIMBER LANDS

DETROIT, Dec. 29—Ford Motor Co. has taken over the Stearns & Culver Co.'s timber holdings in Baraga county, this state, and the mill operated by that company at L'Anse. The holdings embrace about 30,000 acres of timber land in Baraga and adjacent counties, in addition to about 15,000,000 feet of manufactured lumber.

The reason for the Ford company taking over the raw timber properties and the L'Anse mill, is that they were closer to some of his former timber holdings than his present mill at Iron Mountain. The Ford mill at Iron Mountain is the most complete and capacious in the Upper Peninsula and the L'Anse mill is its closest rival.

#### U. S. TIRES TO ADVANCE

NEW YORK, Dec. 30—Prices of United States tires will be advanced on Jan. 2. It is said that the increase will amount to 5 per cent on dealer business and 12 per cent on consumers'. This applies to all cords of all sizes, all tubes and fabrics above 30x3½. Truck pneumatics and solids and small size fabrics are not affected.

#### 1923 Grand Prix Race to Be Over 14-Mile Course at Tours

#### Main Event, in July, Will Be 500-Mile Speed Contest for 122 Cu. In. Cars

PARIS, Dec. 20 (By mail)—A triangular course measuring 14.2 miles round, about four miles to the north of Tours, has been selected for the French Grand Prix road races to be held during the first fortnight of July. The town of Tours is 105 miles to the southwest of Paris and during the war figured as Headquarters of the Service of Supply of the American army. One of the biggest flying schools of the American service was about a mile from the proposed race course.

In order to influence the national club in its choice, the Municipality and local authorities of Tours got together a subvention of 300,000 francs and also undertook to relay the whole of the roads and to widen where necessary.

There will be three distinct races on this course, the most important being the 500 mile speed test for 122 cubic inch cars. This will be followed by a race on a fuel consumption basis with three classes of cars admitted. There will also be a long distance motor cycle race.

Althought entries close on the last day of the year, no cars have been enrolled at this date for the French Grand Prix events. This, however, is not causing much concern with the club, for, as an entry fee of 5000 francs per car has to be paid, competitors wait until the last month before putting their names on the list. The prospects are that the firms to start in the 122 cubic inch race will be the following: Peugeot, Rolland-Pilan, Fiat, Bugatti, Sunbeam, with possibly Delage also. This would give from 15 to 18 cars.

#### 10 Per Cent Alcohol Must Be Added to Fuel in France

#### Steps Taken to Reduce Amount of Gasoline Required for Motor Vehicles

PARIS, Dec. 20 (By mail)—Four hundred members of the French Parliament, constituting the majority of that body, have approved the government project making it compulsory to mix 10 per cent alcohol with all gasoline sold in France. The total amount of gasoline consumed in France during 1922 was 180,000,000 American gallons. It is expected that the consumption will increase to 200,000,000 gallons for 1923; but by adopting the alcohol mixture the amount of fuel to purchase abroad would not increase.

French experts are of the opinion that the alcohol-gasoline mixture is the only solution available at the present time. A 50 per cent mixture of benzol-alcohol is being used by the Paris omnibuses, but owing to the fact that practically all benzol supplies come from Germany this mixture cannot be obtained by the general public.

#### Army Trucks Use Mixture

During the last six months all the army trucks attached to the Sevran-Livry powder works have run on a gasoline-alcohol mixture. Long tests showed that a fleet of trucks running on straight gasoline averaged 13.08 miles to the gallon. The same trucks running under the same conditions with 10 per cent alcohol mixed with the gasoline averaged 12.6 miles to the gallon. Capt. Buat, who had charge of these tests, reports that the percentage of alcohol can be increased to 45 without any change in the design of the engine, and without any appreciable increase in fuel consumption.

Daniel Berthelot, Member of the French Institute, declares that the initial difficulties of mixing alcohol with gasoline, and which caused the adoption of the benzol-alcohol mixture, have now been overcome by the invention of En-This provides for the gineer Loriette. use of pure alcohol, from which all water elements have been removed, and which can be mixed with gasoline in any proportion, and is also soluble in kerosene. Bench tests carried out at the laboratory of the De Dion Bouton Automobile Co. show that higher efficiency was obtained with this mixture than with straight gasoline, and that the specific consumption was lower.

#### 30,482 MILES OF ROADS

WASHINGTON, Dec. 30—The total road mileage in Arkansas of first grade roads is now 30,482 miles, of which 1782 miles is Federal-ald roads, according to road census for 1922 by the Bureau of Public Roads. The total road mileage of the State, including dirt roads, is 74,866 miles, as compared with 50,743 miles in 1914.

Surfaced and paved roads in the state

in 1914 were 1098 miles, compared with 3871 miles at the present time. The figures show that the per capital highway taxes in the State last year was \$13.06. The total revenue for roads in 1921 amounted to \$22,886,970, or \$435 for each square mile of area and \$305 for each mile of road.

#### European Grand Prix Race Scheduled for Monza Track

PARIS. Dec. 20-Italy obtained the approval of all the delegates attending the London meeting of the Association of Recognized Automobile Clubs for the institution of an annual European Grand Prix race, the first one of which will be run on the Monza track near Milan, next September, for cars of 122 cubic inch piston displacement. Important cash prizes will be offered for this event, and it is understood that German firms will be admitted. The guiding principle is that the race shall be held each year in the country of the winner on the previous year, but whatever may happen next year it has been agreed that France shall have the European Grand Prix in The country running the European Grand Prix will undertake not to organize any other international race during that year.

#### I. H. C. LOUISVILLE OPENING

LOUISVILLE, Ky., Dec. 29—Officials of the International Harvester Co. of America are expected to attend the formal opening of the Louisville branch house Jan. 4. The new home has been completed at a cost of \$500,000. Luncheon will be served at noon for visitors, it was announced. The company recently moved its offices from New Albany to Louisville. The new warehouse and offices are located at Fourtenth and Walnut strets.

#### "ASK 'EM TO BUY" IN NEW YORK

NEW YORK, Jan. 2—A large meeting for automobile dealers and garage and maintenance men will be held Jan. 10 at Carnegie Hall under the auspices of the Metropolitan jobber members of the Automotive Equipment Association. The meeting will begin at 1:45 p.m. The "Ask 'Em to Buy" and "Shop Profits" moving pictures of the A. E. A. will be shown, and Ray W. Sherman, merchandising director of the A. E. A., is scheduled to deliver an address.

#### PHILADELPHIA SHOW DRAWINGS

PHILADELPHIA, Dec. 30—Drawings for spaces for the exhibition of cars and accessories at the twenty-second annual Automobile Show in the Commercial Museum, Jan. 13 to 20, have been held. There are 58 spaces drawn for that number of car exhibitors, who will show a total of 71 makes of cars and an aggregate of about 300 separate cars of various models.

# Chicago Dealers Optimistic As New Year Brings Sales

#### Eyes Already Turned Toward Spring When Heavy Buying Is Expected to Materialize

CHICAGO, Jan. 2—The New York show is welcomed with optimism by the automotive merchants of Chicago nad vicinity who foresee a continuance, and possible improvement, of the satisfactory volume of sales which has been maintained up to this time.

Although sales are by no means at the high point of last summer, they are not nearly so low as at this time last year and there are indications that a decided improvement will be noted from now on into next summer. The enclosed car demand has been insistent here as elsewhere and a number of dealers have been unable to get sufficient cars of this type to fill orders promptly. Many open cars have been equipped with California type tops and sold.

#### Automobiles for Gifts

There was considerable giving of new automobiles for Christmas gifts, some of the higher priced vehicles figuring in this. But the greatest activity in winter sales is expected to come this month, with the distribution of dividends, bonuses and semi-annual incomes. Many persons already are looking forward to spring and some orders are being given for early spring delivery of motor cars. The number of such orders is expected to increase steadily.

Special efforts have been made this winter to sell stocks of used cars, with fair success. The early fall reduction in Ford prices drove used car prices so low that the field of potential buyers was greatly enlarged. At the same time the low market value of used cars has prevented the sale of numbers of new cars. the owners prefering to drive the old one rather than sell it for what could be allowed by a dealer. Dealers have cut prices on used cars as low as possible to avoid carrying them over into the new year. One dealer gave a 1923 state license free with every used car sold before Jan. 1. Others reduced the down payments to insignificant figures and gave longer time than customary for payment of balances.

#### BLOOMINGTON ELECTS

BLOOMINGTON, Ill., Dec. 29—The Bloomington Automobile and Tractor Association elected officers for 1923 as follows: President, H. Dale Rue; vice-president, F. H. Cole; secretary, E. E. Pierson; treasurer, Ernest Martens. The new president is at the head of the Rue Motor Car Co., distributors of Ford cars in the McLean county territory. He was identified with the Chicago association of dealers and is a strong believer in the value of local, state and national organizations of the dealers.

#### Cleveland Factories to Run Heavily to Enclosed Models

#### Prepare for Demand Which They Believe Will Continue Into Spring

CLEVELAND, Dec. 30—Cleveland automobile factories are banking heavily on a big run of business for 1923 in enclosed models.

Never before has so much of the factory production in this city been devoted at this time of the year to the turning out of enclosed cars. The seasonal demand is largely responsible, but it is a fact that an unusually large number of enclosed cars will be turned out for delivery in the spring and summer months.

The Peerless organization has considerably more than half of the factory's production in the enclosed types of cars, and company executives say this may be taken as a trend of 1923 buying. This company now has seven enclosed types that will provide a car for every use.

The Chandler and Cleveland companies also are pushing enclosed models in their production, as are the Jordan and Stearns companies.

The dealers are advertising the closed models almost exclusively. The pushing of open models is limited largely to used

care

Milwaukee Dealers Prepare Displays for Annual Show

MILWAUKEE, Wis., Jan. 2-Distributors and dealers are busily engaged in getting together their displays and framing the final details of their campaigns to carry them successfully through the annual show season, which looms as the biggest proposition confronting them at this moment. The show opens in the Auditorium Jan. 20 and closes Jan. 27. Like past Milwaukee shows, it embraces every established dealer, not merely a certain group. The organization behind it, the Milwaukee Automotive Dealers' Association, is such that admission to its ranks is a distinct privilege and membership is a hall-mark.

Selling effort is going on intensively. Sales dropped off during the past week, although the decline was particularly noticeable in comparison with a rather unexpected but gratifying large and voluntary call for cars just before the Christmas holidays. Relief from extreme winter conditions in the week of Dec. 17 to 23 exerted a beneficial effect on sales of both open and enclosed cars.

#### TRYING TO BANISH TRAILERS

PHILADELPHIA, Dec. 30—An effort to banish all motor truck trailers from the streets of Philadelphia will be made at the next meeting of the State Legislature, according to Coroner Knight.

The Coroner disclosed this information following the inquest into the death of a man who was run over and killed on Dec. 10, by a trailer attached to his own truck. The man was standing between the truck and the trailer when an automobile struck the rear of the trailer. The driver of the automobile was exonerated.

#### Employers' Liability Law Upheld

SPRINGFIELD, Ill., Dec. 30—The Illinois Supreme Court, stressing the liability of an employer in permitting a hazard of danger to exist, sustains the lower court in a decision just handed down which is of deep interest to all garage proprietors.

Henry Bodendeck and Edward Zimmerman, operating a garage at Taylorville, Ill., opposed a claim of Mrs. Mary Morris, allowed by the state industrial board. Her son was fatally burned in an explosion which followed when he tossed a match into a pan of gasoline in the garage after lighting a cigaret. The mother was awarded compensation of \$5,000 under the employers' liability law. The employers fought the claim in the board hearing, before the circuit court, and finally in the supreme court, but lost in each.

The firm maintained that the accident would not have occurred but for the employe's carelessness. The question of an appeal to the United States Supreme Court is now being considered.

#### TO MARKET 4-WHEEL BRAKE

DETROIT, Dec. 30—The Four Wheel Hydraulic Brake Co., is preparing to place its new hydraulic four-wheel brake on the market and will exhibit it during the New York national automobile show at one of the hotels. Demonstrations will be given on a standard type automobile which has been equipped at the company's Detroit factory. The brake is patented under the name Lockheed, which is the phonetic spelling of the last name of the inventor, Malcolm Loughead.

#### N. A. M. R. IS ORGANIZED

LOUISVILLE, Ky., Dec. 30—Organization of the National Association of Manufacturers' Representatives, with the expectation that it later will become affiliated with the Automotive Equipment Association, has been undertaken, according to E. G. Schoen of Schoen Bros., Louisville, who is acting as commissioner. It is planned to hold a meeting in Chicago in April and to hold regular annual meetings at the time of the A. E. A. conventions.

#### CHICAGO-ST. LOUIS BUS

JOLIET, Ill., Dec. 30—The DeLuxe Motorbus Company, which is applying to the Illinois Commerce Commission for permission to operate a bus line through this state, proposes to establish a line from Chicago to St. Louis. It will run via Joliet, Ottawa, Peoria, Springfield.

#### General Motors Acquires Brown-Lipe-Chapin Company

#### Takes Complete Control of Differential and Gear Plant at Syracuse, N. Y.

NEW YORK, Dec. 30—The Brown-Lipe-Chapin Co. of Syracuse, N. Y., is now a definite unit of the General Motors Corp. through the acquisition of all outstanding stock by the G. M. C., according to an announcement made by Pierre S. du Pont, president of General Motors. At the same time it was stated that H. W. Chapin, who since the company started business has been general manager, has been elected president of the Brown-Lipe-Chapin Co., succeeding A. T. Brown

General Motors for some time has had a considerable interest in this big Syracuse concern which specializes in the manufacture of automobile differentials and gears, but did not control it. This interest is said to have been about 20 per cent. Under the new deal the G. M. C. becomes complete owner of the company. The first interest was acquired something like ten years ago, when the Weston-Mott Co., of Flint, Mich., became a G. M. C. unit. Up to 1912 General Motors owned 49 per cent of the Weston-Mott stock, with C. M. Mott owning the remaining 51 per cent. At that time Weston-Mott owned a large interest in the Brown-Lipe-Chapin Co., so that when in 1912 General Motors acquired C. S. Mott's interests in the the Weston-Mott Co. the deal included the Brown-Lipe-Chapin stock.

This deal in no way involves the Brown-Lipe Gear Co., also of Syracuse, which has been closely identified with the other company. A. E. Parsons, general manager of the Brown-Lipe Gear Co., when reached at Syracuse over the long distance telephone, declared positively that the purchase of the Brown-Lipe-Chapin stock by General Motors would have no bearing upon the Brown-Lipe Gear Co. He asserted that his company is not in any sense a subsidiary of Brown-Lipe-Chapin and that there has been no change in stock ownership in the past six years. Brown-Lipe Gear will continue to operate as an independent enterprise, Parsons said.

The Brown-Lipe-Chapin Co. was incorporated Feb. 2, 1910, with a capital stock of \$1,500,000 and no funded debt. Dividends ranging from 20 to 30 per cent were formerly paid. Previous to this recent General Motors deal, the officers of the Syracuse concern were: Alex T. Brown, president; A. E. Parsons, vice-president; S. H. Cook, vice-president and assistant general manager; H. W. Chapin, secretary-treasurer and general manager. The directors were Brown, Parsons, Chapin, C. S. Mott and Alfred P. Sloan, Jr.

#### Wisconsin Business "Carries On" After Christmas Recess

#### Nash and LaFayette Continue With Construction Work on New Plants

MILWAUKEE, Wis., Jan. 2—Resumption of activity today after the holiday recess marks the beginning of one of the most important periods of expansion that the automotive industries in Milwaukee and Wisconsin have ever experienced. While the present week continues to witness a reduced production schedule in many shops pending the completion of inventories, events are occurring which far overshadow the temporary and customary lull.

So far as the Milwaukee district is concerned, the chief event is the practical completion of the new works of the LaFayette Motors Corp. and the beginning of the transfer of the equipment and stock of the original plant at Mars Hill, Indianapolis, to Milwaukee. The main building, 200x1000 ft., is situated on Clement Avenue, just south of Oklahoma Avenue, adjoining the four-cylinder car division of the Nash Motors Co. The LaFayette operating organization began to mobilize today.

An event of practically equal importance is the progress of work on additions to the Nash four-cylinder works at this point, which means the starting of equipment work that within a short time will increase the present capacity 100 per cent.

#### Chevrolet Starts

At Janesville, Wis., 70 miles southwest of Milwaukee, this day marks the commencement of initial production operations in a large new branch works of the Chevrolet Motors Co., and the virtual completion, ready for equipment installation, of a new unit of the Fisher Body division. The Chevrolet plant occupies the vast works built at Janesville in the last three years for the Samson Tractor division of General Motors, and an addition costing \$100,000 which provides the necessary facilities to put the former tractor works into a position of greatest efficiency for passenger car assembling by the continuous or progressive system of production. The new Fisher body plant cost \$300,000 and is expected to be ready to start operations late in January.

At Hartford, Wis., forty miles north of Milwaukee, the Kissel Motor Car Cotoday begins to make use of remodeled and enlarged works, including a new power plant which costs \$175,000 or more. This work is the forerunner of building and equipment activities covering another six months to a year, by which Kissel will make available greatly enlarged facilities for manufacturing passenger cars as well as trucks.

Within a few weeks the second unit of the Seaman Body Corp. plant at Milwaukee, increasing the present output

100 per cent, will be ready to go into production. The additional investment will be between \$750,000 and \$900,000 by a duplication of the original works erected within the past three years at a cost at that time of nearly \$1,250,000. The Seaman company is affiliated with Nash and Lafayette and specializes in enclosed bodies.

#### Honey as an Anti-Freeze Solution

MILWAUKEE, Wis., Jan. 2— Honey, from the busy bee, is the best anti-freeze material for automobile radiators yet discovered, according to the statements of experts at the annual convention of the Wisconsin Beekeepers' Association in Milwaukee. The statement was supported by E. R. Root, editor of a beekeepers magazine, who officially supervised exhaustive experiments. Honey will turn to sugar but will never freeze. It is found also to be economical, for one filling lasts through the winter, while alcohol and other mediums need frequent replenishment, and honey does not evaporate. The correct proportion for zero temperature is two parts honey and one part water. Cheap, dark, heavy grades of extracted honey work as well as the more expensive commercial honey for food. The honey and water must

be thoroughly mixed

What could be more appropriate
than to put honey into a honeycomb
radiator?

#### KEEPING ROADS FREE OF SNOW

PHILADELPHIA, Dec. 30 — Snow-storms will not delay motor travel on the state highways of Pennsylvania this winter, if the State Highway Department can prevent it. The department plans to keep clear 1,715 miles of highways all through the winter, and this mileage is considerably greater than before. As rapidly as the highway routes of the state are improved with durable pavement, they are included among the roads to be kept open for traffic.

The department will use 125 snow plows, 65 road machines, 140 trucks, 14 tractors and more than 200 drags in the removal of snow.

#### ENCLOSED CAR PREFERENCE

MOLINE, Ill., Dec. 30—Canvass of Moline automobile dealers indicates that between 60 and 80 per cent of all car sales in this city in the last four months have been enclosed cars. Opinion of the salesmen is divided but the majority of them report that the sentiment is rapidly swinging in favor of the closed car.

#### PHILADELPHIA DEMAND GOOD

PHILADELPHIA, Dec. 30—Automobile distributors and dealers report a continued demand for all classes of cars, with, however, preference shown for enclosed models. Sales of used cars are somewhat slow, as are truck sales, though sales of truck parts are good.

#### Durant Production Reached 6000 Vehicles in December

Star Output 6000 Behind Schedule, Which Was 10,000 By Jan. 1

NEW YORK, Dec. 29—Durant is taking inventory right now. His plants at Leaside, Lansing and Muncie closed last Saturday and will remain idle until Jan. 2. Long Island and California plants also are taking inventory, but this has not stopped manufacturing operations. The Mason plant at Flint also is taking account of stock without a shutdown, while Locomobile will inventory during the first ten days of February.

All Durant plants have had an exceedingly busy December and the total production for the month in all the factories will total 6,000. Elizabeth is making preparations to start manufacturing the Durant four starting Jan. 2. Until the new Durant plant at Flint is completed, which will be some time in March. Long Island City will turn out 25 Durant fours a day.

The Star is moving briskly and the first of the year will see it 6000 behind schedule, it having been booked for a total of 10,000 by Jan. 1. Elizabeth is well into production with the Star and only recently the first shipment was made from this factory, containing 255 Stars and 50 Durant fours, which went to the Harper Motor Car Co., of Washington, the city in which the Star first was shown.

#### WILLS JOHNSON DIES

NEW YORK, Dec. 29—Wills Johnson, chairman of the Appropriation Committee of the General Motors Corp., died suddenly Christmas Day at his home near Greenwood, Virginia. He also held the position of an assistant to Alfred P. Sloan, Jr., vice-president in charge of operations of General Motors Corp. Prior to coming with General Motors Corp., Johnson had been connected with the du Pont Company in the engineering department.

#### FORD-MILWAUKEE CLOSES

MILWAUKEE, Wis., Jan. 2—The Milwaukee assembling plant of the Ford Motor Co. is closed down only one week this year for inventory, the recess having started Dec. 30. Operations will be resumed Jan. 8 on a 100 per cent capacity basis, according to order received by H, M. Buckley, general manager.

#### REDUCES PISTON PRICES

ST. LOUIS, Dec. 30—Reduced prices for its entire line of pistons and pins are announced by the McQuay-Norris Mfg. Co., effective Jan. 2. This company has been in the piston and pin business only one year, following its absorption of the Wainwright Engineering Corp., of Connersville, Ind.

#### **BUSINESS NOTES**

Three buildings of the Wickwire-Spencer Company's plant at Buffalo, N. Y., have been taken over by the Pyrene Manufacturing Co. for the purpose of manufacturing Off'N'On chains for automobiles.

The Stanley Toy Works of Stanley, Wis., has placed into quantity production, following the relief of facilities from holiday merchandise requirements, a standardized battery box which it has been manufacturing for several months.

The Detroit sales office of the Van Norman Machine Tool Co., Springfield, Mass., will be managed after Jan. 1 by R. A. Griswold. Griswold previously represented the Rivet Lathe & Grinder Co. in Detroit and other sections of the country, and later served with B. C. Ames as field representative.

The Universal Shock Eliminator Co., Inc., of 7 West 61st street, New York, has taken the eastern distribution for the Lockhead four-wheel brake system, made by the Four Wheel Hydraulic Brake Co. of Detroit, Mich.

The Burgany Automotive Parts Co., Cincinnati, O., has been chartered with a capital of \$25,000 to manufacture and sell various automotive parts and accessories.

The DeJon Electric Corp., has been incorporated in Delaware with a capital of \$500,000, to manufacture electrical systems for automobiles

#### Stewart-Warner Sales for 1922 Largest in History

CHICAGO, Dec. 30—Closing the best year in its history, the Stewart-Warner Speedometer Corporation finds that December sales have been such that all indications are that this month will be second only to June in volume. The unusually large volume of sales experienced by the company through the fourth quarter of the year has caused genuine surprise to the officials, who attribute it largely to the great increase in winter driving.

Sales of the company for the first nine months of this year showed an increase of 83 per cent over the corresponding period of 1921 and 16 per cent over the corresponding period of 1920.

Sales in June of this year were the largest of any month in the company's history, having exceeded by 13 per cent the volume of the next best month which was May, 1920. A noticeable feature of this year's business is the fact that sales of articles for retail distribution have been as well maintained as sales to car manufacturers. The company manufactures a number of articles of automotive equipment.

#### ANOTHER SWINDLER BUSY

Information concerning a clever swindler is given in a letter to Motor Age from the L. E. Tait Motor Co., Lincoln, Neb. This swindler gave the name of J. Arden Bell and represented himself as an engineer for a large Iowa construction company. This man called at the salesroom of the Tait company and said he wanted to buy a used car. He finally decided to take a new Dort sedan and made a partial payment. He claimed he would receive the balance of the money from his company in a few days. The dealer took a mortgage on the car and the purchaser was permitted to take it out. He had rented an office and furnished it, and claimed he was looking

for a house for his family. The same day he placed an order with a truck dealer for three trucks to be delivered within 60 days. That night he left town and has never been back. He is described as weighing about 155 pounds and being 5 feet 11 inches tall, with thin face and prominent upper teeth; about 40 years old and very bald.

#### NEW TIMKEN UNIT

CANTON, O., Dec. 30—A new organization known as the Timken Roller Bearing Service & Sales Co. will start to function Jan. 1 for the distribution and servicing of Timken bearings. The new organization, operating directly under the supervision of the Timken Roller Bearing Co., will maintain factory branches in 32 cities and in addition will have a country-wide organization of registered authorized distributors in the smaller cities.

Following are the cities in which factory branches will be maintained: Atlanta, Ga.; Baltimore, Birmingham, Ala.; Boston, Brooklyn, Buffalo, N. Y.; Cleveland, Chicago, Dallas, Denver, Detroit, Fresno, Cal.; Indianapolis, Kansas City, Mo.; Los Angeles, Milwaukee, Minneapolis, Newark, N. J.; New Orleans, New York, Oklahoma City, Omaha, Philadelphia, Pittsburgh, Pa.; Portland, Ore.; Richmond, Va.; St. Louis, Salt Lake City, San Francisco, Seattle, Toronto and Winnipeg, Canada.

#### TO CHECK UP ON MEASURE

COLUMBUS, O., Dec. 30-Eight oil and gasoline distributing companies in Columbus, O., have offered to stand the expense of two men to check up on gasoline and oil measurements at gas filling stations to prevent short selling. The offer was made by the Pure Oil Co, The Central Ohio Oil Co., the Columbus Oil Co., The National Refining Co., The Scioto Oil Co., the American Products Co. and the Accurate Measure Oil Co. In two occasions the City Sealer of Weights and Measures, assisted by the Columbus Police Department, has made raids in which about a score of filling stations were found to be giving short measure. The expense of the raids were met by the Columbus Automobile Club.

#### TAXICAB OWNERS' CONVENTION

CHICAGO, Dec. 30—The semi-annual winter convention of the National Association of Taxicab Owners will be held at the Hotel Sherman, Chicago, Feb. 15-16. Membership of this association now includes over 100 companies, located throughout the United States, with members also in Canada, Mexico and Japan.

Problems of vital interest to taxicab operators will be discussed at this convention, including insurance, municipal ordinances for the regulation of taxicabs, "jay walking," rate reductions and safety campaigns.

John J. Boobar, general manager of the Terminal Taxicab Co. of Washington, is president of the association. John G. Williams is secretary with offices at 500 North Dearborn street, Chicago.

#### Chapin Says 1922 Has Been Hudson's Most Successful Year

#### Total Sales for Fiscal Year Ending Nov. 30 Were 26,271 Hudsons and 34,962 Essexes

DETROIT, Dec. 30—Hudson Motor Car Co., in its consolidated balance sheet as of Nov. 30, shows current assets of \$15,497,577.24 as against current liabilities of \$5,031,411.90, a ratio of three to one. Cash on hand, \$7,236,547.96, sight drafts \$2,385,802.31, and inventories of \$5,378,007.35 with \$497,219.62 accounts receivable, make up the current assets. Current liabilities are accounts payable \$3,957,491.12, distributors' deposits and accrued accounts, \$1,073,920.78. Reserve for Federal taxes in 1923 is \$1,012,200.

In a statement to stockholders, President Roy D. 'Chapin said the past fiscal year had been Hudson's most successful, both with regard to earnings and to the development of the product to a higher point and its manufacture on a basis of unusual value to the buyer. Sales for the year were 26,271 Hudsons and 34,962 Essexes, he said.

The already long list of dealers has been made much larger, the statement said, and a large demand for enclosed cars has been built up which greatly increases sales. "We believe," Chapin said, "our percentage of closed models produced this year to be the highest in the motor car industry."

Plant assets are listed at \$8,828,300.93, after provision for depreciation. Capital stock is \$13,201,000, and the surplus is \$5,289,475.27. The consolidated income account shows gross profits from sales of cars and parts of \$12,631,176.45, which with interest earned and other income places the total income at \$12,948,842.68. Selling, service, administrative, general expenses and other charges against income total \$3,339,661.46. Depreciation is \$1,220,387.02 and interest paid \$133,917.16. This leaves a net income transferred to surplus account of \$7,242,677.04.

The surplus account shows a surplus of \$10,508,287.23 on Dec. 1, 1921, with net income from this year making \$17,750,964.27. Less dividends during year of \$1,761,489 and surplus transferred to capital stock account of \$10,700,000, the surplus on Nov. 30, 1922, is \$5,289,475.27.

#### YEAR'S UPKEEP FOR \$30

BALTIMORE, Md., Dec. 30—Norwood Brothers, Inc., has just made an announcement to the effect that the firm will keep any new Overland car bought from them from now on in proper running condition, including labor and parts, excepting only batteries and tires, and damages from wrecks, for an entire year at a cost of \$30. The offer, it is announced, was made after a careful analysis of the performance record of Overland cars on the streets of Baltimore.

#### IN THE RETAIL FIELD

Joe Cattoi, Hurley, Wis., a leading northern Wisconsin dealer, has plans for a \$30,000 sales and service building, work on which will be started about April 1.

The Auto Battery & Electric Co., Baraboo, Wis., has been sold by Helbig & Wickus to Percy Alexander of Baraboo, who took immediate possession.

J. E. Trulson, formerly shop foreman for the Franklin Williams Motor Co., Kansas City, Mo., and C. B. Stewart with the same firm, have opened a Franklin service station under the firm name of Franklin Service & Repairs, 2624 Troost avenue, Kansas City.

The Medick-Erb-Ferguson Co., Columbus, O., authorized Ford and Lincoln agency, has recently been incorporated. The temporary location is at 2584 N. High St. This company is building a garage and sales room at 2519 N. High street.

The Stephens Fihers Auto Co., of South Manchester, Conn., has changed its name to the Stephens-Conkey Auto Co.

The Williamantic, Conn., Motors, Inc., has been incorporated with an authorized capital stock of \$10,000. Incorporators are William H. Horton, Thomas Moore and William V. Holden.

The Capitol Garage Co., Madison, Wis., will build a fireproof garage, sales and service building, 60x165 ft., two stories and basement, at an estimated cost of \$45,000.

Star and Durant cars will be handled in Ames, Iowa, by Duitch Bros. A sales room has been obtained at 113 Main street.

The Dana Battery Co. is the name of a new battery station operating at 114 Main street, Ames, Iowa. Vesta batteries will be sold.

C. W. Nickelsen, of Ames, Iowa, has moved his repair shop from 5th street to new quarters at 111 Main street.

The Westinghouse Battery franchise for Ames, Iowa, has been obtained by the McClarey Battery Co.

tery Co.

The twelfth authorized Ford and Lincoln dealership in Milwaukee, Wis., has just been allotted to the Todd Motor Co., organized by A. E. Todd, for 11 years with the Ford Motor Co., and for six years assistant manager of the New York City branch. The headquarters of the new concern are at Kinnickinnic avenue and Wilson street, in the Bay View district of the city of Milwaukee.

Guy W. Rogers, 279 Gillett street, Fond du Lac, Wis., has been appointed Jordan dealer in Fond du Lac and Dodge counties. For the past year he was associated with the Dunham & McCumber Agency, Fond du Lac, which acted as Jordan dealer.

The E. H. Trice Motor Co., Inc., of Waterbury, Conn., has been incorporated with an authorized capital stock of \$60,000. Business is to be started with a capital of \$30,000. Incorporators are Edward H. Trice, Ruth W. Trice and Jeannette Pickard.

James Justus of Columbus, O., who has been interested in the Justus & Parker Co., wholesalers in accessories, has purchased the business and stock of the Larkin Auto Supply Store, 430 Main treet, Zanesville, O., at administrator's sale.

sale.

The Albert Hirst Motor Co., Inc., of New York City, New York and New Jersey, distributors for the Gray Car, reports the appointment of the following New Jersey dealers: Charles Beck, Westwood, N. J.; F. Cardone, Bayonne, N. J.; Peter H. Hendricks, 90 Albany street, New Brunswick, N. J.; Chas. H. Mghrs, 739 Main street, Passaic, N. J.; Nash Motor Sales Corp., Morristown, N. J.; Arrow Garage, Towsco, N. J.; Gray Motor Sales Co., Dover, N. J.; Automobile Machine Shop & Garage, Boonton, N. J.

The DeBear Motor Car Co., Philadelphia, dispersions of the Control of the Cardon Philadelphia, dispersion of the Cardon Philadelphia, disper

The DeBear Motor Car Co., Philadelphia, distributor for Maxwell and Chalmers cars, has moved from 216 North Broad street, to larger quarters at 219-225 North Broad street, in the Flint building. The service department will be at Thirty-first and Thompson streets, in a new

building, now in course of erection. Temporary service quarters have been opened at 1316 Poplar street, near Broad.

M. J. Osborn Co., St. Paul Ford dealer, has sold out to Springfield capital. A. C. Hall and H. F. Herschbach, well known Illinois dealers, have bought stock and business and will call it Hall-Herschbach Motor Co. Herschbach has been a Ford dealer six years and Hall was with the Jennings Auto Sales Co., Ford dealer.

The Gray Motor Sales Co., Ford dealer.

The Gray Motor Sales Co. has been formed in Atlanta to succeed Thorp & Knight, and has taken over distribution of the Gray car in Georgia. P. H. Layfield is named general manager of the new company. Atlanta salesrooms are at 239 Peachtree street. W. H. Wynn, of Atlanta, is president of the company.

T. McDowell, Jr., and S. H. Striplin, both of Columbus, Ga., have formed a new company known as McDowell & Striplin, and have purchased from J. B. and E. E. French the Hupmobile agency at Columbus. McDowell and Striplin have been connected with Dodge Brothers agency at Columbus for some years.

The Motor Sales & Truck Co. has been formed at Leakesville, N. C., headed by W. H. Smith, of that city, and will establish an automobile agency there. M. B. Heiner, of Spray, N. C., and E. E. Emerson, of Spray, are the other incorporators.

The Triangle Garage Corporation has been formed at De Land, Fla., with \$20,000 capital, and will establish a large service station in that city, and also act as an automotive agency. Tom B. Stewart, of De Land, is president.

The William B. Chellis Co., former Liberty dealer in Springfield, Mass., is going out of business. Chester R. Giddings has taken over the Liberty.

Elbert C. Tenney, Studebaker dealer at Brattleboro, Vt., will occupy a new salesroom soon after New Year's. A new service building is to be erected the coming spring.

Announcement has been made that the Baltimore Lexington Co., Inc., Baltimore, Md., has been appointed the new distributor for the Lexington. The company has an establishment at Howard street and Park avenue.

The Hudson-Essex Motor Co., and also the Chevrolet Motor Co., both of Aurora, Ill., have rented rooms in the new Essex building, corner of River and Holbrook streets, and will take possession in January. This structure cost \$90,000 and is ideally adapted for motor car sales agencies. The front is of white faced brick with white stone trimmings. There is a frontage of 120 feet and depth of 100 feet.

The garage of Harry Clugston in Doddville, Schuyler county, Ill., was destroyed by fire on Dec. 19. All of the cars awaiting repairs were removed. The owner plans to rebuild.

J. W. Sloan has organized the Sloan Motor Co. and will shortly open a garage and sales agency at Havana, Ill. He will distribute the Durant and Star cars in the Mason county territory.

The garage and sales agency of the Monroe Motor Car Co., of Bushnell, Ill., was destroyed by fire. The flames swept away nearly a block of buildings with a total loss of \$100,000. A number of cars awaiting repairs were destroyed in the garage fire. R. F. Heckle was the owner of the garage building and plans to rebuild next spring.

The Anger Engineering Co., 2525 State street, Milwaukee, Ford dealer, has changed its corporate title to Bailey Motor Car Co. B. F. Anger retired some time ago to become Chevro-let distributor. Leslie A. Bailey took over his interest and became president and general manager. William W. Koeppel is secretary.

T. C. Vawter, Danville, Ill., distributor of the Packard and Maxwell cars, has organized the Green-Vawter Co., and articles of incorporation have been applied for. It is proposed to add some lines additional, including taxi cab and perhaps motor bus service. Plans for the expansion will be announced later

#### S. F. BOWSER PARTY

FORT WAYNE, Ind., Dec. 30—At the annual party for the employes of S. F. Bowser & Co., tank and pump manufacturers, S. F. Bowser, founder of the company, and chairman of the board of directors, told employes that the company enjoyed a very prosperous year during

1922 and that continued good business is expected in 1923.

"Our schedule of business for 1923," Bowser said, "is a million a month. This will be \$12,000,000 for 1923 which will be over \$3,000,000 more than any previous year in our history. This will crowd our factory to the limit and more.

#### December Texas Sales Will Probably Set Year's Record

#### Business Certain to Surpass Any Previous December in History

DALLAS, Texas, Dec. 30—Despite the present winter weather and the fact that there was a general tendency toward "tightening up" in all lines, the actual retail sales of automobiles in Texas during December probably set a record for the year, and certainly the sales surpassed any previous December in the history of the business in Texas, according to reports from various sections of the state.

The phenomenal sales in December may be attributed to the fact that dealers conducted a campaign of "put a car in her stocking" for several weeks preceding Christmas. The dealers say the campaign produced the goods and that it will be repeated next Christmas.

Dallas dealers report retail sales increased 20 per cent over those of the last December. Houston dealers say the sales were 25 per cent better than a year ago. San Antonio retailers report a 30 per cent increase over the same month of the preceding year. Ft. Worth retailers had a 15 per cent increase. Wichita Falls retailers sold 15 per cent more cars this month than they did for the same month in 1921. Galveston, Beaumont, Waco, Abilene, Orange, El Paso, Amarillo, Denison, Sherman, Tyler, Greenville, Palestine, Port Arthur, Corpus Christi and Texarkana reported from 10 to 15 per cent increase in sales when compared with December of 1921.

The sales were confined to no particular make or price of cars. Everybody appeared to share in the increase.

But the dealers did not stop at "put a car in her stocking." They went further and advocated through the same line of advertising, personal letters, telephone calls and personal solicitation, and put over a "buy something appropriate for Dad" idea which moved a large amount of tires and accessories. Accessory dealers reported large sales of heaters, robes, lights, batteries, plugs, etc. Tire men sold many extra tires and tubes for Christmas gifts.

#### KELLY-SPRINGFIELD REPORT

SPRINGFIELD, Ohio, Dec. 30—Receiver Pearl A. Lewis, of the Kelly-Springfield Motor Truck Co., has reported to the Common Pleas court that he will make a saving of \$36,000 a year by a reduction in the number of executive officers and combining the work of others. The savings in payroll, total about \$3,000 a month. These are effected by substitution of three executives drawing a total of \$1,176 a month in place of officers and executives drawing \$2,591.67 a month and the discontinuance of eight officials drawing a total of \$2,328 a month. The receiver named his salary at \$500 a month.

#### CONCERNING MEN YOU KNOW

George W. Browne, a pioneer dealer of Milwaukee, has resumed the active management of the Overland Wisconsin Co., distributor, and George W. Browne, Automobiles, Inc., dealer in the Overland and Willys-Knight, following the retirement of Thomas C. McMillan, who on Jan. 1 became active head of a new automobile financing corporation in Milwaukee.

ing corporation in Milwaukee.

Charles S. Shuman has tendered his resignation as treasurer of the Vacuum Muffler Corp. of New York and Bridgeport to take up his new work as assistant cashier of the Catawissa National Bank, to which position he was recently elected. He will remain on the board of directors of the Vacuum Muffler Corp. President Christophersen, of the Vacuum Muffler Corp. will take entire charge of both the executive and developing work.

developing work.

E. G. Norris, Seattle branch manager of the McQuay-Norris Manufacturing Co. of St. Louis, has been appointed western manager of the company. He will have jurisdiction over the sales and distribution of McQuay-Norris piston rings, pistons and pins in California, Oregon, Washington, Idaho, Montana, Utah, Nevada and Arizona. The position of western manager is a new position created for the purpose of uniting the western states under one central department in order to better serve the interests of jobbers and dealers. Branch offices located in San Francisco and Seattle are not affected by the change. Norris will make his headquarters at 314 Loew-Warfield building, San Francisco.

Moie Cook, formerly of the Service Motor

Marheld building, San Francisco.

Moie Cook, formerly of the Service Motor Truck Co, of Wabash, Ind., has acquired a substantial interest in the business of the Indiana Truck Corp. and is arranging to move his family to Marion. Steps will be taken very shortly to elect Cook vice-president, and his work will be along executive and managerial lines with the organization.

organization.

L. F. Bartels, for years affiliated with the Moline Plow Co., has joined the Dort as factory sales representative in New England, New York, Pennsylvania and Delaware. Bartels was formerly branch manager for the Moline company at Minneapolis and recently became assistant division manager of the Atlantic states division with headquarters at Poughkeepsie. He succeeds C. R. Teaboldt, former Dort district sales manager, who has taken over the management of the Dort branch in New York.

E. P. Rowan, formerly with the B. F. Good-

branch in New York.

E. P. Rowan, formerly with the B. F. Goodrich Rubber Co., has become associated with Thomas J. Hay, Inc., 2521 Michigan avenue, Chandler distributors for northern and central Illinois, in the capacity of manager of the wholesale department. Rowan was with the Rubber Company from 1897 to 1921. He came to Chicago in 1905 as branch manager and later became district manager. In 1919 he went to Akron as sales manager for Diamond tires.

R. B. King, a well known motor truck sales-

R. B. King, a well known motor truck salesman, has Joined the Transport Truck Co. at Mount Pleasant, Michigan. He will spend part of the time at the Transport general offices, and part among the Transport's distributing organization.

Walter P. Hanson, who for a number of years has held the position of assistant director of ad-

vertising for The Haynes Automobile Co., Kokomo, Ind., has been appointed to the position of advertising manager, according to an announcement by Gilbert Y. Radoye, director of sales and advertising for the Haynes company. Ross H. Garrigus becomes assistant advertising manager, under the new organization plan.

Announcement is made of the addition to the staff of the Manhattan Electrical Supply Co., Inc., of K. M. Smith as general battery sales manager. Smith formerly was general sales manager of the Gould Storage Battery Co. During the war he served as assistant to William C. Potter, director of aircraft production.

C. Potter, director of aircraft production.

William E. Cairns, formerly a development engineer with Cadillac Motor Car Co. and the Detroit Pressed Steel Co., died at St. Petersburg, Fla. For years Cairns was a prominent engineer in the industry, his research work in pressed steel winning him wide recognition. He learned the trade of toolmaker with William Smith, chief development engineer of Ford Motor Co., and at different times was in the organization of the John R. Keim Co., Buffalo, Parish, Bingham & Co., Cleveland, and the Cadillac and Detroit Pressed Steel companies. He is survived by a widow and four children.

Samuel Fitzpatrick, export manager of the Columbia Motor Co., announces the appointment of C. I. Whitehead, a veteran in the automotive industry in South Africa, as special representative for the Columbia Motors Co. in that market.

Ira Fry, chief tester for the R. & V. Knight Motor Co., was killed Dec. 26 in a road accident. He had been with the company 14 years and had been chief tester for three years. He was 33 years old.

Bert M. Petit, formerly of Racine and Kenosha, Wis., and widely known in the automotive industries, has been appointed manager of the Milwaukee branch of the Goodyear Tire & Rubber Co. He is a graduate of the University of Chicago and Massachusetts Tech. For several years he served as advertising manager of the J. I. Case T. M. Co., Racine, later going to the J. I. Case Plow Works Co., as advertising and sales manager and secretary of the Wallis Tractor Co. Four years ago he joined the Goodyear Farm Bureau.

J. H. W. Mackie of the Payne Motor Co., Minneapolis, president of the new Allied Automotive Industries, has been selected as head of a committee of a Minneapolis-Minnesota, \$50,000 advertising fund, which includes delegates from 35 civic organizations. This is an important position as the committee is to combine with other committees throughout Minnesota to advertise the state far and wide.

Thomas C. McMillan, former president of the Milwaukee Automotive Dealers Association, and one of the best known men in the passenger car trade of the Middle West, has retired as secretary-treasurer of the Overland Wisconsin Co. and affiliated concerns, to devote his entire attention to automotive financing. He has worked out a new plan of financing dealers as well as buyers which will be announced soon.

#### SPRINGFIELD BUYS PLANT

NEW YORK, Dec. 30—The recently formed Springfield Body Corp. has made a purchase contract for a large plant in Northern New Jersey with a capacity of from 5000 to 7500 custom jobs a year and taken an option on another plant with a yearly capacity of 10,000 bodies in the Detroit district. Officers elected at the meeting on Dec. 22, are: Clarence S. Dame, president and treasurer; Arthur H. Wolfe, vice president, and Frank M. Livingstone, assistant treasurer and secretary.

#### SYRACUSE TO REORGANIZE

SYRACUSE, N. Y., Dec. 30—Reorganization of the Syracuse Rubber Co., now in the hands of William F. Rafferty, as receiver, is proposed by a stockholders' committee. The definite plan has not been worked out, but one will be presented before time comes to take action on the proposed sale of the plant.

#### Cleveland Dealers Encourage Owners to Drive All Winter

#### Result Is Considerable Stimulation of Enclosed Car Sales and Service

CLEVELAND, Dec. 30—Dealers here are placing special emphasis on selling the idea of winter driving.

Salesmen are instructed to feature the idea that it is expensive to lay a car up for winter when they go out to talk to owners of cars. If the owner of an open car does not happen to be in the market for a new car and has laid up his car for the cold months, he is advised to get it out and drive to and from work, even though the mercury does hover below zero part of the time. The owner is told to rig up his curtains, and care is taken with the mechanical parts to see that everything is ready.

"I have sold many an enclosed model after being refused in my first talk, by getting the owner to drive through the wintry blasts in his curtained car," said W. H. Williamson, a Nash salesman. "The convenience of riding in a car in winter, when street cars are late and crowded, is so apparent to the owner that it is not long before he envies his neighbors who skim along in enclosed cars. It is only a matter of time until that car owner buys an enclosed model."

That this argument is having an effect is proved by the increasing number of cars that are being driven. Traffic officers say their work is only slightly less than it is in the summer. Last winter, their work dropped off fully 30 per cent.

#### ARMY TRUCKS HURT SALES

DETROIT, Dec. 30—Disposal of thousands of trucks used in the war to states for highway building was declared largely responsible for the poor condition in the truck market in the past two years by President H. M. Lee of Duplex Truck Co., at the annual meeting of the company. The financial statement of the company showed a deficit of \$49,386.30 for 1922.

To meet conditions in the truck field, the company plans to devote about 40 per cent of its facilities to the manufacture of busses, for which the company reports a large demand. The present truck line will be increased by two new models.

#### TIRE MEN TO HEAR LECTURES

DES MOINES, Iowa, Dec. 30—Foremen of Des Moines tire factories will hold a series of conferences this winter at which lectures will be given by E. J. Reeder of the engineering extension department of Iowa State College. Fourteen conferences in all are planned, the first to be held Jan. 8. The aim of the conferences is to deal with the broader phases of factory control and management.

# Prizes for Employes Who Lower the Production Costs

SYRACUSE, N. Y., Dec. 30—Prizes for employes who develop methods or devices for lowering production costs without impairing the quality of the Franklin, were awarded by William Dunk, production manager of the H. H. Franklin Company last week. A total of \$4000 was distributed this year, bringing the total amount divided among employes since the plan was inaugurated to \$11,600.

The company is keeping secret the nature of the suggestions made by the employes who were awarded prizes which ranged from \$25 to \$400. Every employe in the plant is invited to participate in the annual suggestion contest, which company officials say is proving a great success, and has aided in materially reducing the cost of production.

# The READERS CLEARING HOUSE Questions & Answers on Dealers Problems

# From Car Speed to Wheel Wobble

Q-What is the maximum speed of the following cars: Jordan, Hudson, Chandler and Dodge?

1—When you ask for the maximum speed of any automobile you are asking a very indefinite question. Being in the automobile business, you probably realize the great variation that exists in the actual speed that can be secured from any motor vehicle. A Chandler car, for instance, bearing serial number 7456 might have a maximum speed of 60 m.p.h while a Chandler having a serial number 7467 may show an actual maximum speed of 65 m.p.h. Even though both cars be of the same chassis model with the same body.

It is only possible, therefore, to supply you with the average maximum speed that can be obtained from the open models or touring models of the cars referred to, which is as follows: Jordan, 60 to 65 m.p.h.; Hudson, 65 m.p.h.; Chandler, 60 m.p.h.; Dodge, 50 to 52 m.p.h Condition of chassis, especially the engine, will show great variation in the performance of any car, especially in the speed that can be secured.

2—How many cars did Chandler and Jordan make in the month of August?

2—Production figures from the two factories mentioned have not been made available for publication and we would suggest that you communicate with the respective factories. Where production figures are given they are generally printed as news items in Motor Age and although we have searched our files covering news items regarding production during August, we do not find any item that pertains to production from either factory referred to.

3-What is the usual cause of front wheels wobbling?

3—An article which is a review of the present opinions regarding the cause of wheel wobble was printed in the November 16th, 1922, issue of Motor Age, beginning on page 19.

4—Can the maximum speed of a car be figured by the engine speed, gear ratio and sizes of tires? If so, how?—Albert H. Tallman, Pontiac, Ill.

4—The factors that enter into the computation of the possible speed of a car are the r.p.m. of the engine, the diameter of the wheel and the gear ratio or final reduction at the rear axle.

For example, a car is traveling with a speed in miles per hour corresponding to an engine speed of 2400 r.p.m. It has a gear ratio of 4.5 to 1 and is equipped with 32x4 tires. What, then, is the speed of the car in miles per hour?

2400 placed over 4.5 equals the number of revolutions the wheel

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

Readers' names will not be published with articles, if a request to this effect is received with the letter. The name and address should be given, however, so that we can send a copy of our answer direct by letter. This saves waiting for the answer to be published, which sometimes occurs several weeks later, depending upon the space available.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

makes at an engine speed of 2400 r.p.m., or 32 times 3 times 3.1416 over twelve equals the number of feet of travel in one revolution of the wheel, and this multiplied by 60 equals the distance covered in one hour. Since there are 5280 feet in a mile, the formula becomes 2400 times 32 times 3.1416 times 60 divided by m.p.h., or

4.5 times 5280 times 12 equals 50.5  $2400\times32\times3.1416\times60$ 

#### $4.5 \times 5280 \times 12$

It can be stated in the following formula: Speed or miles per hour equals D times 3.1416 divided by 12 times R divided by G, where D is the diameter of the tire in inches, R is the maximum engine revolutions per minute, and G is the rear axle gear ratio. It is also necessary to multiply by 60, the number of minutes in an hour and divide by 5280 the number of feet in a mile.

# The Right and Wrong Use of the Cadmium Test

Q—Advise the effects of overcharging a battery. Also advise in regard to the cadmium test, as to whether it is a practical test to make.—Ariel G. Olson, Milwaukee, Wis.

1-The electrical energy used in charging a battery is normally used up in producing the chemical change. That is, the lead sulphate is changed back into lead oxide and spongy lead. When, however, the charging rate is too high, so that the electrical energy is not all used in this way, or when the battery is nearly charged, so that very little of the chemical action is possible, then another action takes place. The electrical energy now breaks up the water into hy-drogen and oxygen gas. This produces a condition of gassing or bubbling which, if excessive, tends to loosen the active material and at the same time a considerable amount of heat is produced.

An occasional overcharge at a low rate is supposed to be helpful, as it puts the plates in a thoroughly charged condition and frees them from sulphate. In the chemical action that takes place on charging a battery, heat is produced, and heat is also produced by the current flowing through the internal resistance of the plates, separators and acid. For this reason a certain amount of heating will take place when charging the battery and the most serious effect of overcharging is probably due to the excess heat thus generated.

The buckling of battery plates is commonly attributed to overheating produced by overcharging, although authorities are not all agreed on this, as occasionally buckling of plates will apparently occur when no overheating has occurred, as far as can be determined. The common temperature limit is considered 100 degrees Fahrenheit, although some authorities say that it is permissible to go up to 105 or 110 degrees.

The cadmium test is sometimes used for the purpose of inserting in a customer's battery to see whether the battery needs new plates or not. This is not a legitimate use for the cadmium test. The legitimate use is in connection with a battery that has been rebuilt; for example, has had new positive plates and new separators put in and then at the end of a charge run the cadmium test is used to determine the voltage condition of the positive plates and a separate test is made for the negative plates. Then, when a battery which has been rebuilt is discharged, a cadmium test can be taken at the end of the discharge run to see if the plates are normal.

Two important things are necessary (Continued on next page)

#### Good Front Makes Them Stop



Q—Jackson Garage, Jackson, Ohio, is shown in the enclosed photograph on a main traveled road one-half mile from the city of Jackson, Ohio, population 5,000. After seeing the "Ask 'Em to Buy" film Mr. Harry Scott has requested writer to secure for him your suggestions for the remodeling of the front of his institution to make it look like business establishment and to enable him to put in a complete and full stock of automotive equipment.

I am furnishing a sketch giving you what information I can and would appreciate, in the interests of better merchandising, your suggestions for the remodeling of this institution.—M. D. Gra-District Manager, The Sparks-Withington Co., Jackson, Michigan.

At the request of Mr. M. D. Graham of the Sparks-Withington Company, we are sending you a suggestion for the restucco when the first coat is applied so Architectural Service

I N giving architectural advice, MOTOR AGE claims to assist its readers in their problems of a claims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building neces-sary to automotive activity. When making request for assistance, please see that we have all the data necessary to an intelli-gent handling of the job. Among other things,

we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.



building of your front so that it will be more attractive to the passing motorist.

Our plan would be to do this in stucco upon metal lath with wooden framework but, of course, it would be better to build the framework of hollow tile in that it would be less subjected to cracking. The signs would be painted or preferably made of wood or metal letters. The decorations should be of bright colored green and red tile set into the

that the last coat will be flush with its surface. The doorway need not be more than 9 ft. wide which will leave more room for the store.

If the building is exposed on both sides it would be well to stucco the sidewalls a short distance back with windows in the office and stockroom. This will relieve it from an appearance of sham or false front and give a more substantial air.

#### (Continued from preceding page)

to watch in connection with the cadmium test. One is that the cadmium stick be left in water so that sulphate does not form on the ouside, as this throws the reading way off. Another thing is to make sure that the test is made at the end of a charge or discharge run and while the battery is still being charged or discharged. Under other conditions the readings have no real value whatever.

#### BULB IN ONE LAMP BURNS OUT OTHERS O. K.

Q—We have a Ford car that periodically (about twice a week) burns out the left head lamp bulb. As the lights are all in parallel and connections are good why should this trouble always occur in the same bulb all the time? The battery to be a support of the same bulb all the time? tery terminals and ground were removed, tery terminals and ground were removed, cleaned and tightened. All other connections were inspected, even to the lead welding job on the cell connectors and even after reducing the generator charging rate from 18 amp. to 10 or 12, this with home out the characteristics. bulb burns out in about two weeks time.

The head lamp is firm on its bracket so we do not believe that the trouble is due to vibration, and that removes our last hope of locating the cause of this condition. What suggestions have you to of-fer?—C. E. Packer, Hinsdae, Ill.

While the steps you have taken to overcome the trouble are good, we would suggest that it would be more advantageous to use a voltmeter and see with the engine running just what the voltage conditions are at various points of the wiring. At first glance the problem does seem to be a mean one and there does not seem to be any good reason why one lamp bulb should burn out more than the others. We would, however, suggest your taking a voltmeter and getting the voltage right at the back of the lamp connection on both left and right head

If we are properly informed, two separate connections run to the head lamps from the junction block at the left side of the dash and the one to the right head lamp would be slightly longer than the one to the left head lamp. Our opinion is that there is a poor connection, possibly an intermittent one, between the generator and battery which at times gives a high voltage and that, due to the wire to the left head lamp being slightly shorter, the effect is noticed there. It would seem, however, even with this explanation, as if the right head lamp would burn out occasionally.

We would suggest your running the engine and taking generator voltage and then battery voltage and if the difference is in excess of .5 volts it may indicate the cause of the trouble. We would then suggest your taking voltage from the battery side of the starter switch to ground and then at the junction block end of the small wire that runs from the starter switch. We would then suggest taking voltage from the ammeter to ground, making a test at both ammeter

There is a possibility that the trouble is in the ammeter, and this should show up by a difference in voltage reading. Even if you do not find any definite cause for the trouble, would suggest your trying a new ammeter, as it may be there is an intermittent poor connection in the meter. Would also suggest replacing wire from ammeter to junction block and junction block to starter switch.

Another possibility occurs to us, and that is that the separators in the battery are of high resistance. This would show up by getting perhaps 8 or 9 volts at the battery when the engine is running and the generator charging. We would also suggest taking the bulb from the right head lamp and putting it in the left head lamp to see if it will burn out there in case you do not find the trouble as a result of the above suggestions.

#### Buick Speed and Valve Timing

Q-Why is the Model E-45 Buick of greater speed than the K-45 when both have practically the same engine, bevel gear and pinion?

1—Although the K-45 and E-45 contain practically the same engine, the E-45 has a 34 in. wheel and the K-45 has a 33 in. wheel, which accounts for the slight difference in speed.

2—Give valve timing diagram for both models in relation to piston or flywheel.

2—The valve timing marks are plainly visible on the Buick flywheel. The illustration shown, however, gives the required timing, this being correct for both models E and K 6 cylinder Buick engines.

3—What causes the socalled valve knock in a late Buick when idling and how can it be eliminated? The gasoline mixture and spark do not affect this noise. The engine is also free of carbon. What is the best method of locating a valve which is knocking?

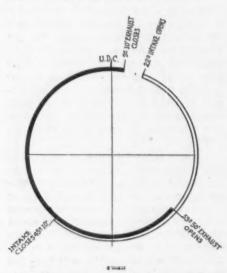
3—If by a late Buick you mean one of the type that has a compound push rod made of aluminum and steel, there should be no reason for valve noise. These rods can be set with a clearance of .006 to .008 in.

To test for noise in the push rods, however, you can use a screwdriver and put a sideways pressure on the vertical rods which operate the rocker arm, as this will take out any side play, and if you find that a noise is eliminated by pushing sideways with a screwdriver you can figure that you have located the trouble. On the late Ruick cars there is not much likelihood of valve noise as, in addition to the compound push rods, they use felt packing around the valve stems. This being saturated with oil tends to prevent noise.

4—What are the best methods of locating loose main bearings in a Buick six without removing crankcase?

4—One rough indication is to suddenly accelerate the motor and if this produces a clattering sound it is quite likely that the main bearings are loose.

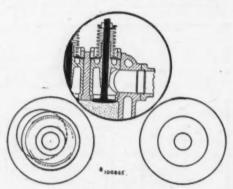
5—How can loose connecting rod bearings be located without removing engine



Valve timing on 1-45 and K-46 Buick

pan, and how can this condition be distinguished from trouble due to loose pistons or wrist pins?

5—Work on one cylinder at a time, removing the spark plug and putting into the spark plug opening about a table-spoonful of 600 W. Then run the engine again and this heavy oil will act as a cushion around the sides of the pistons



Buick Valve and Cage

and in the wrist pin bearings and will eliminate noise in that one cylinder. Work on the cylinders one at a time in this fashion and if at any one cylinder the application of 600 W. eliminates the noise you can depend on it that it is due to a loose piston or loose wrist pin in that cylinder.

If none of the noise is reduced by this application to all of the cylinders one at a time, it is then quite likely that the connection rod bearings are loose. Test for loose connecting rods is usually made by short circuiting one spark plug at a time and if this eliminates the noise it shows that that particular connecting rod is causing the trouble. This is due to the fact that in shorting a spark plug you relieve the connecting rods from carrying the strain of the explosion pressure.

6—Is there an electrical device on the market for short circuiting 1, 2, 3 or more spark plugs on a 6 cylinder engine by means of a switch on the cowl or dash with leads running to the plugs?—XYZ, Lakewood, N. J.

6—We do not know of any such device made for 6 cylinder engines, although we have seen something of the kind designed for 4 cylinder engines. It is, however, very easy to disconnect the spark plug wires from as many plugs as desired and drop them on the cylinders so as to run the engine on any number of cylinders for purposes of testing.

#### WASHING THE CAR

Q—Give any data that you may have on washing automobiles with chemicals, compressed air, etc., for public wash rack.—J. J. Bonner, Houston, Texas.

An article dealing with modern methods of cleaning was printed in the November 23, 1922, issue of Motor Age on page 22. Several modern car washing installations have been made using the method of cleaning with the high pressure spray nozzle equipment as described in this article.

#### Value of Quick Paint Job Questionable

Q-Do you know of any system of painting automobiles from the metal up in five or six days, using, say, eight or ten coats of paint.

1—There are such systems as this that are being offered to auto paint shops but we cannot recommend them. Jobs so painted, that we have run down or heard about, are not satisfactory and it will take a year anyway to thoroughly try out any such methods.

Apparently these systems are nothing more than the incorporation of quickdrying materials with the slower ones—resulting in a speeding up of the drying rates but with a resultant effect that can only be determined by ordinary wear and tear. It is contrary to all present theory and practice used in producing high grade work.

If such work is desired there are a number of materials that can be mixed with the slow drying ones that will give such results as you state, but there is danger of the job's going bad quickly and it would hardly be good business to use such methods on eight or ten coat work.

After this system has been in use for a long enough time to have withstood exposure for a year or more definite results will be at hand. The theory of it is not good paint engineering as now understood and we do not have confidence in it.

2—Do you know of any economical and successful paint removers that will not damage the cloth or leather on automobiles?—D. McQueen, Birmingham, Ala.

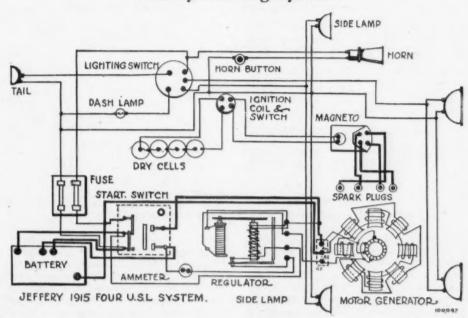
2—Any paint remover strong enough to act on the paint will necessarily have some effect on cloth upholstery. Where strong acid is used this may destroy it where touched; other solutions may only bleach or clean it out but they will leave it spotted.

### TO INCREASE CHARGING RATE OF GENERATOR

Q—We have three Chevrolet generators, 1922-23 models which have a maximum charging rate of 10 amperes. This does not seem to be enough to keep the battery in proper condition, and we have found that shifting the main brushes to any other position than the neutral plane, cuts down the charging rate. What would you advise doing to make these generators charge 12 to 15 amperes?—Y. and L. Battery Service, Fort Madison, Iowa.

You have used the wrong method for increasing the current, as the main brushes should not be shifted from the neutral plane. The correct way to raise the charging current is to move the third brush. If it should be necessary to reset the main brushes you can do it by lifting the third brush and then setting the main brushes so that there is no tendency for the armature to rotate when a 6 volt battery is connected across the main brushes. Then when you have the main brushes set in the neutral plane you can move the third brush to any position that gives the desired results. To increase the charging current the third brush should be moved in the direction of armature rotation.

#### Jeffery Starting System

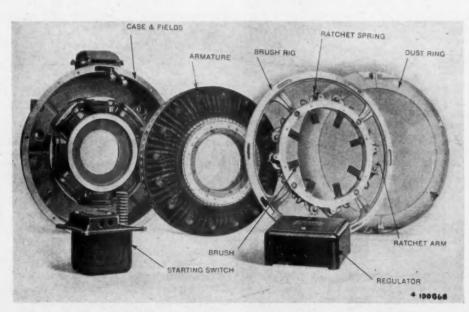


Q—We have a 1915 Jeffery six that will not turn the starter over with the battery fully charged. This is a USL System. We would like to get a wiring diagram of this car and would also like to see a cut that shows the brush position. —United Garage, Fond Du Lac, Wis.

1—Two illustrations are given, one showing the wiring diagram requested while the other shows the main part of the starting motor. From the latter illustration, it will be seen that there are eight brushes which bear on the commutator of the armature.

With the battery fully charged, starting trouble should be rare on this model and we would suggest the use of a voltmeter in locating the cause of this condition. You will note from the wiring diagram that the starter switch operates to connect the two halves of the battery in series for starting, so that you should get 12 volts at the A plus and A minus terminals of the flywheel starter.

Your test with a voltmeter will then first be at the battery while the starter switch is operated and then at the starter motor to see if there is a very great difference in voltage. If, for example, the battery voltage is the same as the starting motor voltage it shows an open circuit in the starting motor. On the other hand, if the battery voltage is 12 and the starting motor voltage 5.6 it would show an enormous loss of voltage at some point in the circuit due to a poor connection and you would then have to do a little exploring to see just where the trouble might be. From the illustration, and especially from the wiring diagram, you should be able to determine the source of the trouble, and if after taking the various voltage readings you are still unable to correct the condition would suggest your advising us again as to result of the tests you make.



Parts of U. S. L. flywheel type motor generator in 1915 Jeffery

#### LIEN LAW IN WISCONSIN

Q—A is holding a car belonging to B for a repair bill amounting to almost the value of the car. The car is mortgaged. Can A recover? If so, how shall A proceed in the state of Wisconsin?—Auto Sales Co., Menomonee Falls, Wis.

Section 3343 of the Wisconsin Statutes gives every mechanic a lien upon any article of personal property for any repairs he may make thereon. This lien covers only the just and reasonable charges for the repairs. He must keep possession of the property. This section makes this lien prior to a chattel mortgage upon the same property, for all charges not exceeding \$75 in amount, and for the excess in amount over \$75 the lien is subject to the lien of a prior recorded chattel mortgage. This mortgage must have been filed as required by law prior to the commencement of the work for which the lien is claimed.

Section 3346-t gives every garage keeper a lien for repairs and work done on any detached accessory, fitting, or part of an automobile, which is a right to hold and retain possession of any such accessory, fitting or part until charges have been paid. If the charges under this lien remain unpaid for six months, the garage keeper may sell such detached accessory, part or fitting in satisfaction of his claim.

As a mechanic A may proceed under the first section cited above. In this way he can force action to recover at least \$75 and the costs. This may cause the mortgage holder to make a settlement of some kind. A is entitled then to his \$75, then the mortgage holder is entitled to have his mortgage satisfied, and if there remains a balance A would be entitled to apply this on his lien claim. Any balance still due is chargeable, of course, to the car owner who created the debt.

If the property, car, accessory or part does not exceed \$100 in value, then the sale may be made after three months, after due and proper notice has been given to the owner. I take it that the value of the car here exceeds this figure, and if so, A may proceed after six months from date his charges were due only in a court proceedings.

#### COAST TO COAST RECORD

Q—What automobile holds the record from New York to San Francisco? Can the engine number be given and where can this car be found?—John L. Roberts, Beaumont, Texas.

The Essex holds the New York to San Francisco record with a time interval of 4 days 14 hours and 43 minutes. One car started from New York and one from San Francisco at practically the same hour and we have been informed by the local Hudson-Essex dealers that one of these cars is in the state of Texas and that the location of the other may be determined by writing to the factory at Detroit

#### Eliminating Oil Leak At Main Bearing

Q—We are having trouble with an Oldsmobile 8 cylinder car leaking oil somewhere around the rear main bearing. Could it be leaking in the joint where the two cylinder blocks are bolted together?

1—If it is possible for you to take this car to an authorized Oldsmobile service station, it would be the best thing to do. If you are unable to do this you can possibly remedy the trouble by cutting an extra groove in the rear main bearing, as described in the following paragraphs. The instructions we are about to give you are taken from a service sheet supplied to Oldsmobile service stations.

#### Correction of High Oil Consumption With Lynite Pistons on Model 45B 8 Cylinder Car.

See that all valves are seating properly, for poor condition of the valves will tend to make the engine pump oil. Check the ignition timing and see that the engine is hitting on all cylinders. Check up both main and connecting rod bearings to see that they have the proper clearance.

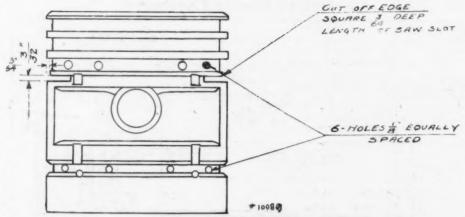
Remove rear main bearing cap assembly and groove as shown in the illustration. Replace and adjust both front and rear main bearings to specifications.

Saw and drill piston as shown in the illustrations, installing three special American Hammered rings in the second, third and fourth ring grooves. Use plain American Hammered rings in the top groove

Take up blade rods by removing shims to standard limit of clearance. Install oil pan spacer No. 382,120 when replacing pan.

#### Correction of High Oil Consumption With Lynite Pistons on Model 37A Six Cylinder Car.

See that all valves are seating properly. Check ignition timing and see



Side view of piston showing oil drain holes on model 37-A Oldsmobile

that engine is hitting up on all cylinders. Take up both main and connecting rod bearings to proper clearances. Drill two grooves in the bearing. These holes center main bearing to meet the two oil holes 5/32 in. diameter in the cap of the should be drilled in an approximate 30 deg. angle from the right hand side of the cap, one hole being on either side of the stud boss in the bearing cap.

Saw 3/32 in. slots on the thrust side of piston 1/16 of an in. below the third ring groove and relieve skirt 3/64 of an in. below its diameter and between lower edge of third ring groove and top of saw slot for the length of the slot.

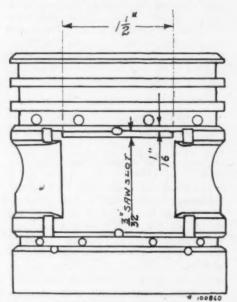
Drill six ½ in. holes straight through piston in the bottom of third and fourth ring grooves at the lower side of groove, staggering with those already in the piston. Install special American Hammered oil rings in second, third and fourth ring grooves, using plain American Hammered rings in top groove.

With cast iron pistons drill six ½ in. holes straight through bottom of the third ring groove and at the lower side of groove staggering them with the holes already in the piston. Install one special American Hammered oil ring in the

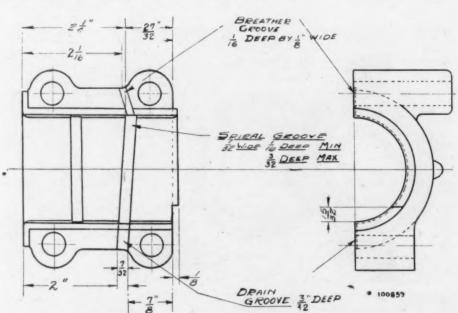
third ring groove, using two plain American Hammered rings in the top grooves with pistons fitted to standard limits of clearance. With excessive clearance two special oil rings to be used in the second and third ring groove with one plain ring on top with reasonable degrees of success. Limits of piston clearance in excess of .005 not recommended.

2—Advise how to stop a Nash Quad engine from leaking oil somewhere in the rear part of the engine. This oil gets into the clutch housing. We put on a new pan gasket and the main bearings are tight and drain holes under main bearing at flange on crankshaft are open.—E. T. Garage, Maxwell, Calif.

2—There is a possibility in this engine that you have not given attention to the rear camshaft bearing which may be also leaking oil. If the camshaft bearing is O. K. and the main bearing continues to leak oil, it would be well to install a new rear main bearing. It also occurs to us that the remedy as described for the Oldsmobile 8 cylinder rear main bearing might also apply to other cars and if you are unable to stop the trouble in any other way, would suggest grooving the rear main bearing as shown in the previous sketch.

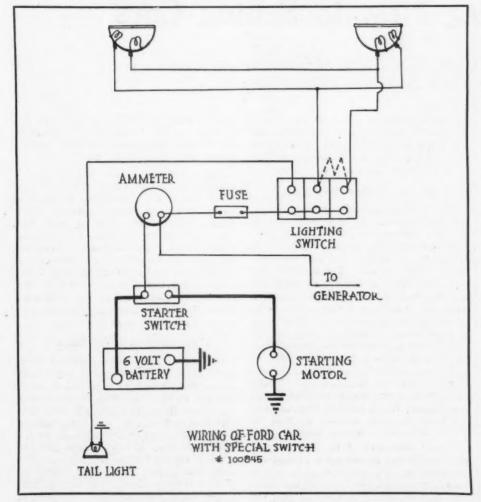


Front view of piston showing oil drain holes on model 373 Oldsmobile



Method of grooving rear main bearing to reduce oil leakage

#### Special Wiring On a Ford Car



Q—We have a 1922 Ford speedster that we wish to equip with electric light. At present this car is not equipped with starter or battery. We are going to use the two headlights and tail light, but wish to wire the headlight in parallel instead of series, using a three gang switch. One gang will be for brights, one gang for dim and the third gang for tail lights. The three gang switch will be mounted on the instrument board, leaving the horn switch on the steering wheel and eliminating the Ford switch. Illustrate method of wiring as per above request. Also explain the function of the square piece of laminated shim, covered with wire, under the hood and what effect it has on the lighting system.—Chas. Gee, Maywood, Ill.

1-You will note herewith diagram giving circuits which you can use. You do not state definitely whether you are going to install a starting motor and generator or not, but if you wish to eliminate the starting motor you can just forget that portion of the diagram. If you wish to eliminate the generator you can do this also, but will have to recharge the pattery occasionally. If you wish to eliminate the battery your scheme is impracticable and you should leave the wiring as it is. This is due to the fact that the magneto generates some 18 volts or more and the two 9 volt lamps wired in series give best results.

If the headlamps have only one bulb instead of the two shown you can use

a dimming resistance, as indicated by the dotted lines connected at the back of the lighting switch. This dimming resistance can be made either of German silver wire or iron wire. As the horn which came with the car is obviously designed for alternating current, it will still have to be connected from the magneto.

In regard to the square piece of laminated shim covered with wires, we would say that this is known as inductance coil and has the ability to offer resistance to alternating current going through it. It is used in the circuit of the headlights to prevent their burning out at high speeds, for the increased frequency of the Ford magneto at high speeds increases the ability of this device to limit the current. Using current from the battery, it has no advantage, and no more effect than so much wire would have, used without the iron framework.

#### CLEANING CARBON FROM BUICK ENGINE

Q—We have a method of cleaning carbon out of Buick engines and we wish to explain the method used. We work on one cylinder at a time usually starting with cylinder No. 1. We remove the spark plug and both valve cages. We then loosen up the carbon by scraping with flexible carbon scraper which we make up for our own use. When we have loosened all of the carbon, we then re-

place the intake valve and cage but do not replace the rocker arm. We then start the engine running it on five cylinders and the carbon will fly out of the spark plug opening and exhaust cage opening.—Frank Sefcik, Cuba, Kas.

1—Motor Age wishes to express appreciation for the suggestion just given. We have no doubt but what this will prove an effective method of doing the job.

#### WOOD BLOCK FOUNDATION FOR LIGHTING PLANT

Q-Will the mountng of a 1 kw. lighting plant on a 24 in. square, wooden block, embedded in concrete, deaden the sound of operation?

1-This method of installing will no doubt be an improvement over mounting directly on concrete. The wood block, however, should not be a plain block but should be corrugated on the edges so that it will be held securely in the concrete. If the sides are plain the block may shrink and become loose in the concrete. One way of getting this result is to build the block up out of boards glued and screwed together. In doing this every other board can be made to extend past the intermediate ones so as to give a rough and unfinished edge into which the concrete will pack and hold securely.

2—Assuming the efficiency of a small 4 cycle engine to be 100, what will the efficiency of a similar two cycle engine be, other things being equal?

2-Approximately 85 per cent.

3-Can you publish a fuel curve?

3—We assume by this that you mean a curve showing the amount of fuel consumed per brake hp. at various speeds, but such a curve could only be obtained by referring to some specific engine.

4—What are the principal disadvantages of the two cycle engine as compared with the four cycle engine?

4—One disadvantage is loss of fuel which enters at the intake port and passes out of the exhaust port without being consumed. Another disadvantage is the low compression available and the low speed, which is normally due to inability to get the fuel into the firing chamber fast enough. When high speed, or comparatively high speed, has been obtained, it is at the expense of a great loss of efficiency.

5-What are the principles of the "Dempsey Cycle?"

5-The "Dempsey Cycle" principle uses an auxiliary air valve in the engine to admit a charge of clean air about at the end of the suction stroke. principle it is necessary to use an overly rich mixture which is diluted at the end of the intake stroke by the opening of the auxiliary valve. One advantage claimed is that the clean air rushing in produces a condition of stratification which assists combustion without pro-Another claim is ducing detonation. that a greater total amount of fuel can be injected by this method.

6—Where can we get a power tire pump for use on a Dodge car?—J. P. Buchanan, Pulaski, Pa.

6—This information will be given by letter.

#### Something New in Selling Cars

Selling Passenger Car Fleets to Commercial Houses for Their Salesmen Proves Success

HAT may be considered a new field for the merchandising of passenger cars has been opened up by Greer-Robbins Co., distributors of the Hupmobile in northern California. This company has undertaken to specialize on the selling of fleets of passenger cars to commercial houses for the use of their salesmen and a sale of 30 cars was recently made to the Globe Milling Co.

This sale was solely for the Globe salesmen in northern California, working from the Oregon line to Bakersfield and the Tehachapi Mountains, which divide southern from northern California. The Greer-Robbins Co. started to build up this fleet in 1918, and the ultimate conversion of the largest milling company in the West to the exclusive use of the kind of car this firm sells was accomplished by the sale of one car for a comparative test

#### What the Buyer Wants

"The secret of selling passenger car fleets to commercial houses," says R. P. ("Bob") Galindo, sales manager for Greer-Robbins, "is to satisfy the demand of the salesman for a car that will always take him where he wants to go and bring him back. The salesman cares nothing about horsepower, differentials, gears, and all that technical stuff. What he wants is transportation, always ready and always reliable. And that, by the way, is what every car buyer wants. I

believe millions of hours of automobile salesmen's time is wasted in impressing too many technical points on the prospect. To paraphrase Shakespeare, 'the car's the thing,' and not the details."

#### Service Makes New Sales

The Globe people do their own repairing and servicing, in their own garage, but the Greer-Robbins Company looks after the cars in a general way, and is always ready with advice and technical and mechanical aid. Every car in the salesmen's fleet is thoroughly inspected and overhauled every ten to fourteen days and, if necessary, the experts from Greer-Robbins are called in. This helps to make every satisfied salesman for the Globe Mills a salesman for Hupmobiles, "and," says Galindo, "ninety per cent of our sales can be traced directly to satisfied owners of Hupmobiles." something for the dealer to think about, and Galindo has a habit of tracing back his sales to their source, so that he knows what he is talking about.

Out of this sale of the fleet to the Globe Mills has grown up a mutual advertising stunt, illustrated here, which has proved profitable both to the mills and to Greer-Robbins Co. In the big main window of the Hupmobile distributors in San Francisco has been installed a Hup of the type used in the fleet, just coming through a wall built of six tons of sacked flour from the Globe mills. After the exhibit has been a while in

San Francisco, it is to be taken to the branches of the Greer-Robbins company in Fresno, Stockton, Oakland, Sacramento and other towns and cities.

This exhibit alone has brought to the Hupmobile distributors the sales of three other fleets, also passenger cars, now being closed in San Francisco. The Globe Mills report that it also has brought in orders for large shipments of flour. Thus, this inexpensive advertising stunt, which by the way obtained a lot of space in the newspapers as news, not only brought closer together the automotive merchandiser and the customer, but more than paid for itself in orders to both of them.

#### Sell on Merit, Not Rebate

Incidentally, the Greer-Robbins Company gives no discounts in these fleet sales. The fleet-buyer pays just as much per car as the man who comes in and buys one Hupmobile for his own use. The fleet-buyer's used cars, of whatever make, are appraised and taken in on the deal, but they are appraised just as closely, car by car, as are those of the individual buyer. The cars are sold on the merit of performances, not as bargains, through discounts or other rebates to the buyer. This is the first time that an automobile distributor in California has specialized in the sale of fleets of passenger cars for salesmen, and the venture has proved a decided success in every way.



One of a fleet of 30 Hupmobiles used by salesmen in towns and rural districts of northern and central California. This display, made in the windows of the Greer-Robbins Co. and its branches, is an advertisement which is getting sales, both for the Hup and the flour.

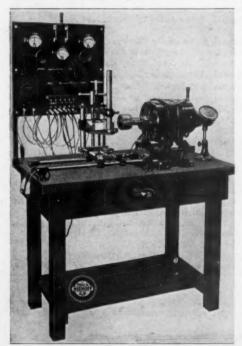
As a direct result of the display, the company is now outfitting three more large firms with fleets of passenger cars

### GETTING MORE OUT of the SHOP

A VERY unusual condition exists in many retail automotive establishments all over the country—many 1922 orders will be carried over to 1923 without being filled which indicates that the eleven and a half million cars which are in operation at the outset of the new year will be added to materially within the first few months of 1923.

Early spring and summer will witness a greater demand on maintenance establishments than has heretofore been recorded.

A test bench, the product of Paul G. Neihoff & Co., 232 E. Ohio street, Chicago,



Neihoff test bench

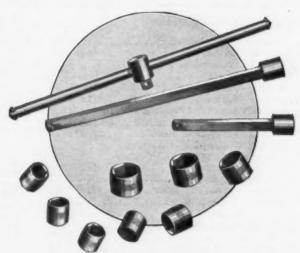
is shown on this page. It is known as the A. E. S. Test Bench and is designed to meet the needs of automotive repair shops where starting motors, generators, magnetos and distributors are being overhauled. The price, complete, is \$375.

One of the features of the Pumpless Blow Torch is the fact that it requires



Pumpless blow torch

no pre-heating to start generation of the gas. The fuel used is By-Tane, a biproduct of gasoline absorption plants. Pumpless Blow Torch Co., Inc., Keystone Bldg., Pittsburgh, Pa.



Snap-On heavy duty socket wrenches

A set of heavy duty wrenches has been announced by the Snap-On Wrench Co., which are distributed by the Motor Tool Specialty Co., 14 E. Jackson boulevard, Chicago. The eight sockets of this set, shown in the cut on this page are milled from selected bar steel and are heat treated. Sliding tee handle and the 8 in. and 16 in. extension bars are of 5% in.

special analysis steel. Any socket fits handle. To lengthen the reach it is necessary to use an extension bar in between—or two if needed. Forty-eight wrenches can be built—eight husky Offset, eight short Tee, eight long Tee, eight short "L", eight long "L" and eight extra-long Tee wrenches. Sockets range in size from 15/16 in. to 1½ in.



Franklin model C grinder

A new portable grinder, Model C, for grinding valves to a fixed angularity and for grinding "reseating" cutters adapted for cutting valve seats to an angularity identical with the valve angularity has recently been developed by the Franklin Machine & Tool Co. of Springfield, Mass.

This new "single purpose" grinder, which is especially designed to meet the needs of repair shop work, can be assembled by the manufacturer for grinding

valves to any desired angle, but it is not adaptable for adjustment from the angle to which it was originally set at the factory.

The motor, which is manufactured by the Westinghouse Electric & Mfg. Co., is mounted on a low, flat base and is located far enough from the grinding wheel, the cross slider, and the valve rotating members to prevent any motor vibration affecting the accuracy of the grinding operation.



Triplexd hose

Triplexd Gasoline Hose is the product of the Metal Hose and Tubing Co., Raymond and Tillary streets, Brooklyn, N. Y. and are made of a combination of metal hose, rubber and fabric. Made for use in the garage, on the wagon or tank car. The cut shows the application of the metal, rubber and fabric.

#### COMING MOTOR EVENTS

Orlando, FlaAnnual Automobile ShowFeb. 13-17 San Diego, CalifJanuary	AUTOMOBILE SHOWS  Erie, Pa Annual Automobile Show. Jan. 1-6 New York Annual Show Jan. 6-13 New York National Automobile Body Builders' Show Jan. 13-20 Buffalo Annual Show. Jan. 13-20 Philadelphia At the Commercial Museum Bldg. Jan. 13-20 Philadelphia At the Commercial Museum Bldg. Jan. 13-20 Scranton, Pa Annual Automobile Show. Jan. 15-20 Hudson, N. Y. Annual Automobile Show. Jan. 16-20 Cleveland, O. Annual Winter Show, Cleveland Automobile Mrr's' and Dealers' Assn. Jan. 20-27 Milwaukee Annual Automobile Show. Jan. 20-27 Milwaukee Annual Automobile Show. Jan. 20-27 Milwaukee Annual Automobile Show. Jan. 20-27 Baltimore. Annual Automobile Show. Jan. 20-27 Montreal. National Motor Show of Eastern Canada Scranton, Pa. Commercial Car Show. Jan. 20-27 Scranton, Pa. Commercial Car Show. Jan. 23-25 Middletown, Connannual Automobile Show. Jan. 24-27 Chicago Annual Show at Coliseum N. A. C. C Jan. 27-Feb. 3 Chicago Annual Show at Coliseum N. A. C. C Jan. 27-Feb. 3 Wilkes-Barre, Pa. Annual Automobile Show. Jan. 29-Feb. 3 Portland, Ore. Annual Automobile Show. Feb. 3-10 Allentown, Pa. Annual Automobile Show. Feb. 3-17 Minneapolis, Minn. Annual Show. Feb. 3-10 Charlotte, N. C. Feb. 5-10 Waterbury, Conn. Annual Automobile Show. Feb. 3-10 Waterbury, Conn. Annual Automobile Show. Feb. 5-10 Charlotte, N. C. Feb. 5-10 Kalamazoo, Mich. Feb. 12-17 Kalamazoo, Mich. Feb. 12-17 Kalamazoo, Mich. Feb. 12-17 Flint, Mich. Feb. 12-17 Flint, Mich. Feb. 12-17 Flint, Mich. Feb. 13-16	Columbus Annual Automobile Show Feb. 15-21 Hartford, Conn Annual Automobile Show Feb. 17-24 Atlanta Annual Automobile Show Feb. 17-24 San Francisco Exposition, Auditorium Feb. 17-24 Gar'd Rapida, Mich Feb. 19-24 Mt. Clemens, Mich Feb. 19-24 Louisville Annual Automobile Show Feb. 19-24 White Plains, N.Y. Annual Automobile Show Feb. 19-24 Schenectady, N. Y. Annual Automobile Show Feb. 19-24 Schenectady, N. Y. Annual Automobile Show Feb. 19-24 Trenton, N. J. Annual Automobile Show Feb. 21-24 Brooklyn, N. Y. Annual Automobile Show of the
	Fort Dodge, IaAnnual Automobile ShowFeb. 13-16 Orlando, FlaAnnual Automobile ShowFeb. 13-17	San Diego, CalifJanuary

## QUEEKS & KATTLES

If You Know Any, Tell Them to Us

More questions from promising Edisons:
Q. What is the difference between a cow and a tomato?—
Tom Walsh.

There is no difference. Neither one can ride a bicycle. A. What is the worst thing a man can do?-Bill Gee.

A. A reply to this will be made by letter as this department does not mention the names of business houses. (You forgot, Mr. Gee, to state whether you are married or not.)

> There was a man who fancied, By driving good and fast, He could get his car across the track Before the train came past. .

> He would miss the engine by an inch And make the train crew sore. There was a man who fancied this, But-there isn't any more!

"Bring On Your 20,000,000 cars," yells Colliers. Wait a while, wait a while, who said anything about 20,000,000? When all the cars are made that are going to be made, they're going to have to burn down all the houses to make room for them.

Some Things Motor Age Would Like to Know

Why, when a customer asks, "What have you in used cars?" does the dealer always take him to his own car right away and try to sell it to him?

Why do dealers, when taking a trade-in on a new car sale, always take the word of the customer about what someone else offered for the old bus instead of going to the other dealer and getting the dope straight?

Why you post the F. O. B. factory price in your window instead of the right price.

#### WHO WANTS A HOME?

We are not surprised to learn that the country is building more garages than homes. When a man gets an automobile, he doesn't have much need for a home.—Philadelphia Inquirer.

#### Anything Will Do

"Your Honor, it is true that the policeman found me sleeping in the gutter, but I was not intoxicated."

"Very well," replied the Judge, "I fine you \$10 for parking more than six inches from the curb."—Exchange.

Now that Christmas is over, one begins to look forward to the time when the baseball teams go south for their winter training and the time when many of the players also go west.

See that you don't go west, nor south either. Start now and may the 1923 make millionaires of all of you.

#### Specifications of Current Motor Truck Models

NAME AND MODEL	Tons	Chastis Price	Bare and Stroke	1	_	Final Drive	NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	Rear	Final Drive	NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	Rear	Final Drive
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Autocar. 26-B Available H1½ Available H2½ Available H2½ Available H3½ Available H5 Available H5 Beck A Jr. Beck B-30	4-6 11/6 2 21/2 31/2 5 1	4100 2475 2775 3160 4175 5375  1285a 1350 1550	4 x5 4 x5 4 x5 4 x5 4 x5 4 x5 4 2x5 5 x6 3 x4s 3 2x5 3 34x5	34x6 36x31/21 36x31/21 36x4k 36x5 36x6 34x5n	36x12 36x5k 36x6k 36x8k 40x5d 40x12 34x5n 34x412n 36x6	D W W W W	Diamend T. K. Diamend T. EL Diamend T. S. Doane Doane Poane *Dodge Brethers. Dorris K-4 Dorris K-7 Dorris K-7 Double Drive. B	31/2 5 5 21/2 31/2 6 34 1 2-21/2 31/2 31/2	3750 4325 4500 4100b 5100b 6000b 730 2490 3400 4400 685a 4000 2775	4 x514 414x519 412x516 434x6 444x534 4534 4534 4 x514 414x512 414x512 312x5 414x512	36x5 36x6 36x6 36x5 36x5 36x6 32x4n 33x5n 36x4 36x5 31x4n 36x6	36x5d 40x6d 40x6d 36x7 36x5d 40x6d 32x4n 33x5n 36x7 36x10 34x4n 36x6	W W C C C C B B W W B W W	Hendrickson. O Hendrickson. N Hendrickson. M Hendrickson. K Huffman. B Huffman. C Huffman. C Huffman. B-B Hurlburt. A-A Hurlburt. B-B Hurlburt. C-C Huffburt. C-C Huffburt. C-D Hurlburt. E-E	11/2 21/2 31/2 5 11/2-2 11/2-2 2-3 1-11/2 2-21/2 3-31/2 4-41/2	2200 2690 3000 4000 1795 1695 2895 1950 2800 3475 4150	35 85 1 4 14 x 5 1 4 14 x 5 1 5 x 6 1 4 3 3 4 x 5 1 2 4 1	36x4n 36x4k 36x5k 36x6 34x31/2 36x31/2 36x4 34x5n 36x4 36x5 36x5 36x5	36x5n 36x7k 36x5dk 40x6 34x6 36x6 36x7 34x5n 36x4d 36x5d 36x6d 40x6d	W
Beck. C-40 Beck. D-50 Bell. M (Iowa) Bell. E (Iowa) Bell. O (Iowa) Bessemer G Bessemer H-2 Bessemer K-2 Bessemer K-2 Bethlehem KN Bethlehem GN	11/2 21/2 1 11/2 21/2 4 1 2 2 4	1950 1495 2100 2550 1450 1990 2895 3695 1195 1795 2495	334x5 416x514 356x516 334x514 412x512 312x5 416x514 412x512 312x5 4 x514 4 x614	36x6 38x7 35x5 34x31/2 34x4 35x5n 36x4 36x5 35x5n 34x4 36x4k 24-21/2	36x6 40x8 35x5n 34x5 35x5n 36x5 36x4d 36x10 35x5n 34x6k 36x8k	W I I D D I B D D W	Duplex. A A Duplex. E E Duty 22  Eagle. 101 Eagle. 106-2	31/2 2 11/2 3	3500 1590 1875 2275 4200 3000	4 x51/4 41/4x51/2 31/2x5 35/4x51/4 33/4x51/4	35x5n 36x8 34x31/2 34x5 34x4k	38x7n 36x8 34x5 34x5 34x7k	I I I B W	Indep'd't(Iowa) B Indep'd't(Iowa) B Indep'd't(Iow) H Indep'd't(Iow) H Indiana It Indiana 2t Indiana 33 Indiana 5 Indiana 5 Indiana It	11/2/21/2 1 11/2-2 21/2-3 31/2-4 5-7		31/2x5 33/4x51/4 41/8x51/2 33/4x51/4 41/8x51/2 41/8x51/2 43/8x51/2 5 x61/4 31/2x5	36x4k 36x4k 36x5k 36x5k 32x4½	34x5 36x7 34x5n k 34x5k 36x7k 36x8k 36x5dk 40x6dk n 32x4 <sup>1</sup> / <sub>2</sub>	c V
Bridgeport. A Bridgeport. C Brinton. C Brinton. C Brockway. E Brockway. S Brockway. SK Brockway. KR Brockway. KS Brockway. KS Brockway. KS Brockway. KS Brockway. R-4 Brockway. R-5	3/2 3 1 1/2 1/2 2/2 3/2 3/2	2500 2975	334x514 412x512 412x6 334x5 418x514 4 x5 418x514 412x514 434x6 412x514	36x4 36x5 36x5	34x6 36x4d 36x10 34x5 36x7 33x5n 36x6 36x6 36x8 36x8 36x8 36x10 36x5d	W W W B W W W W	Fageol 14 Fageol 23 Fageol 3 Fageol 5 Fageol 6 Fageol 7 Fageol 7 Federal 7 Federal UE Federal WE Federal XX *Ford TI	21/2 31/2 5 2 11/2 11/2 2-21/2 31/2-4 5-6 1	3900 5000 5700 1700 1375 1800 2175 2425 3450 4500 380	334x514 436534 415x614 334x5 334x5 416x514 416x514 415x514 415x514 415x514	34x4 36x5k 36x6 36x4 —x5n 35x5n 36x3½ 36x4 36x5 36x6 30x3½	36x7 36x5d 40x6d a 32x41/2	W W W W W W	International	1½ 2 2½ 3 3 5 5	1550 1650 2100 3500 2400 2600 3600 3800	312x514 312x514 312x514 414x5 414x5 414x5 414x5 414x5	36x31-2 36x31-2 36x6n 36x4k 36x4 36x5 36x5	k 36x3½ k 36x5k k 36x6k 36x6dn 36x7k 36x7 40x12k 36x12	1
Brockway. T-4 *Buick  Case *Chevrolet *Chevrolet Thicage Clicage Chicage Clicage Clicage Clicage Clicage Clicage Dicage Dicage Dicage	2 14 11 11/2 21/2 31/3	510b 650 1005	41/4×53/4	36x6 30x31/2 34x4n 33x4n 36x31/2 36x4k 36x5	40x6d 31x4n 38x7 n 30x314n 35x5n k 36x5k 36x7k 36x10 40x12		G.M.C	1 2 2 5†	1295 2375 2375 2375 2450 3600 3700 3700 3950	334x51/2 31/2x51/2 4 x51/2 4 x51/2 4 x51/2 4 x51/2 4 x51/2 4 x51/2 4 x51/2 4 x51/2 4 x51/2 6 41/2x6	34x5n 36x4k 36x4k 36x4 36x5 36x5 36x5 36x5	34x5n 36x7k 36x7k 36x8, 40x5d 40x5d 40x12 40x6d	B W W W W W	K-Z	1 1 2 2 1 2 1 2 1 2 2 1 3 3 3 3 3 3	1750 2075 2550 3350 3850 1295 2100 2645 3350 3350 4000	31/x5 33/4x5 41/x51/2 41/2x51/2 4 x5 33/4x5 4 x6 41/4x6	34x3\2 36x4 36x4 36x5 36x6 34x5 34x4 36x4 36x5 \$6x5 \$6x5	34x5 36x6 36x8 40x10 40x6d 34x5n 34x5 36x7 36x10 36x10 36x12	W W W W B W W W
Clydesdale. 10 Clydesdale. 10A Clydesdale. 18 Clydesdale. 22 Clydesdale. 42 Clydesdale. 65X Clydesdale. 65X Clydesdale. 99 Clydesdale. 120 Commerce. 9 Commerce. 10	1	1485 1535 1890 2385 2475 3250 3450 4100 4500 1150 1450 2500	384x5 384x5 384x5 384x5 419x5 419x5 419x5 419x5 419x5 384x5 384x5	34x5n 34x5n 34x5 34x5 36x3 <sup>1</sup> / <sub>2</sub> 36x4 36x4 36x5 36x6 32x4 <sup>1</sup> / <sub>2</sub> 34x4 <sup>1</sup> / <sub>2</sub> 33x5n	34x5n 34x5n 34x5k 36x6 36x8 36x8 36x8 36x10 40x12 n 32x41/2n 33x5n	B W W W W W W W B	G.M.C. K-101E G.W.W. "Garford !! Garford 25-E Garford 70-H Garford 77-L Garford 68-L Garford 150-/ Gary. !	212 4 5 714 1-114	4050 4050 1850 1590 1990 2750 3750 4500 5200	412x6 412x6 334x512 334x513 334x513 414x512 412x6 5 x612 5 x612 412x6 5 x612 412x6	36x5 36x5 35x5 34x5m 36x3½ 36x4 36x5 36x6 36x6 36x6 36x3½ 36x3½	40x14 40x6d 35x5 34x5n 36x5 36x8 36x5d 40x5d 40x7d 36x5	W W W W W W C W W W	Kalamazoo OK   Kally-S. K-31   Kelly-S. K-35   Kelly-S. K-35   Kelly-S. K-45   Kelly-S. K-41   Kelly-S. K-42   Kelly-S. K-51   Kelly-S. K-66   Kelly-S. K-66   Kelly-S. K-66   Kelly-S. K-66	5 11/2 11/2 21/2 21/2 31/2 31/2 5 6 5-7	4500 2700 2700 2900 2900 3900 3900 3900 4400 4600 4800 3675	41/2x6 33/4x51/4 33/4x51/4 33/4x51/4 41/2x61/2 41/2x61/2 41/2x61/2 41/2x61/2 41/2x61/2 41/2x61/2 41/2x61/2	36x6 36x31/2 36x4 36x4 36x5 36x5 36x5 36x6 36x6 36x6 36x6	40x6d 36x6 36x4d 36x4d 40x5d 36x10 40x5d 40x6d 40x7d 36x7d 36x7	W C C C C C C C C C C C C C C C C C C C
Commerce 12 Commerce 14 Commerce 16 Commerce 16 Commerce 16 Commerce 17 Commerce 22 Commerce 22 Commerce 25 Commerce 25 Commerce 25 Cook 55	1 1/2 1 1/2 6 2 6 2 8 2/4 8 2/4 5 2/4 1 2/2	1695 1800 1995 2150 2150 2495 2495 2470 3600 1250	334x5 334x5 334x5 334x5 416x514 416x514 416x514 416x514 416x514 416x514	36x6n 36x4 36x6	34x4 35x5n 34x6 36x6n 36x7 40x8n 36x7 40x8n 40x8n 33x5n	I I I I W W W	FINAL DRIVI tion, I—Interna r—8 cyl. s—6 c k—pneumatic ti a—price include	E:-B-I Gear, yl. t pres operations severa	W—Wor 2 cyl.—al tional at c al items of ack or d	m. I others are extra cost. I equipment elivery was	e 4 cyl. o n—pne nt. b—pagon.	d—dual teumatic terrice inch	ires.	Kimball	3 4 5 1 11/2 21/2 4 1	3975 4500 5000 5500 1585 1975 2875 3675 2200 3100	414x6 412x6 434x6 5 x6 374x512 414x512 414x512 414x514 416x514		36x8 36x10 40x12 40x7d 34x5n 36x6 36x8 36x12 k 34x5k k 36x6k	W W

<sup>1-</sup>Gramm Pioneer. 2-Kelly-Sringfield.

#### Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons	Change	Bore and Strake	Front		Final Drive	NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	Rear	Final Drive	NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	-	Final Drive
Kleiber BB Kleiber B Kleiber C Kleiber C Kleiber D Koehler D Koehler MCS Koehler MCS Koehler F Koehler MT Trac Krebs 24 Krebs 24 Krebs 45 Krebs 110 Krebs 110	2\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	\$3600 3950 4600 5300 2150 3175 3275 4470 3275 1360 1675 2275 2275 23550 3175	4\fm5\4 4\fm5\4 4\fm2\5\5 5 x8\5 5 x8\5 4 x5\6 4 x5\6 3\fm4x5\2 4 x5\6 3\fm4x5 4\fm5\6 4\fmx5\2 4\fmx5	36x4k 36x5k 36x5 36x6 34x3 <sup>1</sup> / <sub>2</sub> 36x4 36x4 36x4 34x4 <sup>1</sup> / <sub>2</sub> 34x5 36x4 36x4 36x4 36x4 36x5 36x6	36x8 36x5d 40x12 34x5 36x7 36x7 36x10 36x7 34x4 34x5 36x7 36x7 36x8 40x10	W W W W W	Ogden. A2 Ogden. D Ogden. E Old Hickery W Old Reliable. A Old Reliable. C Old Reliable. D Oneida. B9 Oneida. C9 Oneida. D9 Oneida. D9 Oneida. E9 Oshkosh. AA	11/2 21/3 1 11/2 33/3 5 7 7 1 12/3 2 12/3 2 1 2 1/3 2 1 2 1/3 2 1 2 1/3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	\$1775 2350 3500 4250 5000 6000 1095 3200 4050 4725 2485 2585	4 x51/4 41/2x51/2 41/2x51/2 31/2x5 31/2x5	34x5n 36x31/2 36x31/2 34x4 34x4 34x4 36x6 36x6 36x6 36x3 36x3	36x6 36x4d 36x5d 40x6d 40x7d 35x5n 36x8 36x7 36x8 36x10 40x12 36x6n 36x6n	W W W W W W C I W	Seneca M *Service 12 *Service 25 Service 25 Service 37 Service 37 Service 77 Service 77 Service 102 Signal NF Signal H Signal J Signal M Signal R	5-7 14 114 115 2 2 3 3 14 6 1 114 115 2 2 3 3 15 4 6 1 115 2 3 15 3 15 4 15 15 15 15 15 15 15 15 15 15 15 15 15	\$3750 4950 820	419x5/2 439x6 319x4/2 319x5/2 319x5/2 4 x5/2 4 x5/2 419x6 319x6 41	32x4½n 34x5n 34x3½ 36x3½ 35x5n 36x4 36x5 36x5 36x6 34x5n 34x4 34x4 36x5 36x6	30x3½n 32x4½n 34x5n 34x5n 34x5 36x7 38x7n 36x8 36x5d 40x6d 36x5d 40x6d 36x8 40x6d 40x6d	WWBBBWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
Larrabee X-2 Larrabee U Larrabee J Larrabee K Larrabee K-5 Larrabee L-4 Larrabee W	13/2 14-24 21/2-3 21-34 31/4-5	1925 2400 2400 3100 3450 4000 4800	314x41/2 384x5 384x5 41/2x51/2 41/2x51/2 48/4x6	34x5n 34x3½ 34x3½ 36x4 36x4 36x5 36x6	34x5k 36x7 36x8 36x5d	B W W W W	Oshkosh BB Oshkosh BB *Overland 4  Packard EC Packard EX Packard ED	21/4 1/2 2-3 2-21/4 31-41	3485 3585 425 3100 3100 4100	4 x51/s 4 x51/s 33/sx4 4 x51/s 4 x51/s 4 x51/s	36x4 36x6n 36x5	38x7n 38x7n 30x3½n 36x7 40x8n 36x5d	WWW	*Standard .75 Standard .1-K Standard .76 Standard .66 Standard .5-K *Star Sterling .11/ Sterling .2 Sterling .24	11/5 21/5-3 31/5-5 5-7 1/5 11/5 2 21/5	1330 1600 2400 3150 4400 610b 2885 3085 3290	334x5 334x5 416x514 412x512 434x6 318x414 4 x534 4 x534 4 x534	36x3½k 36x4k 36x4k	34x5k 36x8 36x12 40x14 30x3½n 36x5k 36x6k 36x4dk	W W W W W W
Maccar . L. Maccar . H-A Maccar . H-2 Maccar . H-2 Maccar . M-3 Maccar . G MacDonald . A Mack . AB D.R. Mack . AB Chain Mack . AB D.R. Mack . AB D.R. Mack . AB D.R. Mack . AB Chain Mack . AC Chain	2 3 4 5 7 1 1 2 2 2 2 2 3 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	5750 3450 3300 3300 3750 3850 4950 5550 6000 3400	41/8x51/4 41/8x51/4 41/9x51/2 41/9x51/2 41/9x5 41/9x6 4 x5 41/4x5 41/4x5 41/4x5 5 x6 5 x6 5 x6 11/4x5	36x4 36x4 36x4 36x5 36x5 40x7 36x4k 36x4k 36x4k 36x4k 36x6 36x6 36x6 36x6 36x7 36x4	36x5d 36x6d 40x6d 40x14 36x31½dk 36x34dk 36x4dk 36x4dk 36x4dk 40x5dk 40x6d 40x12 40x7d 36x4d		Packard EF Paige 52-19 Paige 52-19 Paige 54-20 Paige 51-18 Parker C-22 Parker G-22 Parker M-20 Parker M-20 Patriot Revere Patriot Lincoln Patriot Lincoln Patriot LS-800 Patriot Washgt'n Pierce-Arrow Pierce-Arrow Pittsburgher Pittsburgher Power F Power F Power F Power 1-143	12235	4500 1950 2420 3145 1875 3200 4850 1380 2050 2175 2900 3200 4350 4850 3000 3800 3800	5 x514 1 x6 3 x6 1 x514	36x6 34x31 34x4 36x5 34x5n 34x5 36x6 35x5n 34x4 36x5 36x5 36x5 36x5 36x5 36x5 36x5 36x5	40x6d 34x8 36x5d 34x8 36x5d 34x8 36x4d 40x5d 40x5d 40x5d 35x5n 36x7 36x4d 36x7 36x4d 36x6 36x7 40x6d 36x7 40x6d	WWWWWWWWWWWWWWWWWWWWWWWWW	Sterling 3-1/2 Sterling 5-W Sterling 5-W Sterling 5-C Sterling 7-1/2 Stewart Ubility Stewart 15 Stewart 9 Stewart 7-X Stewart 10-X Stew	14-14 14-14 114-2 214-3 314-4 114 114 2 3 2 3 2	4325 4950 6000 1245 1445 1790 2390 3190 1245 1095 1790 2150 2490 3150 2800 3750	4\2x6\4 5 x6\4 5 x6\4 5 x6\4 5 x6\4 5 x6\4 3\2x5\6 3\2x5\6 4\3x5\6 4\3x5\6 4\3x5\6 4\3x5\4	36x5k 36x6 36x6 36x6 34x41/20 35x5n 34x31/2 34x4 36x5 34x41/2 34x5n 36x31/2 36x5d 36x4k 36x5d 36x4k 36x5d	40x6d 40x6d 40x7d 34x4!/n 35x5n 34x6 34x8 36x10 34x41/2 34x41/2 34x5 36x5 36x5 36x5 36x5 36x7 36x5d	W C C I I I I I I I I I I I I I I I I I
Mack Trac. AC Mapleleaf. CCe Mapleleaf. AC Mapleleaf. CCe Mapleleaf. CCe Mapleleaf. CD Master Master JW Master	10 113 115 114 2 2 3 4 5 1 114 2 2 114 2 3 14 5 5 6 114 1 114 2 2 14 2 3 14 1 114 2 3 14 1 114 2 1 114 2 1 114 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4950 5500 5750 6000 3600 4050 4800 5625 1200 2290 2290 2290 2890 3190 3990 4490 4990 933 1650 2200 2475 2875 12850 4250 13500 4250 13500 4250 13500 4250 4250 4250 4250 4250 4250 4250 4	5 x6 5 x6 5 x6 5 x6 334x534 1 x534 1 x534 1 x534 1 14x534 1 14x54 1 14x554 1 14x54 1 14x	32x3n 31x5n 34x31/3 36x31/3 36x4 36x5 36x6 34x5n 36x31/3 36x4	36x5d 40x6d 40x6d 34x5 34x5 34x5 34x5 34x5 36x7 40x5d 40x6d 40x6d 40x6d 40x6d 36x7 32x4n 33x5 36x5 36x5 36x6 36x7 32x4n 33x5 36x7 30x5 36x7 30x7 30x7 30x8 36x10 40x6d 30x70 30x70 30x80 30x10 30x70 30x80 30x10 30x70 30x80 30x10 30x80 30x10 30x80 30x10 30x80 30x10 30x80	CCCCWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	*Rainier R-21 Rainier R-29 Rainier R-26 Rainier R-26 Rainier R-28 Rainier R-15 Rainier R-15 Rainier R-27 Rainier R-27 Rainier R-27 Rainier R-17 Rainier R-27 Rainier R-27 Rainier R-27 Rainier R-27 Rainier R-27 Rainier I0A Reliance 10A Reliance 20B Republic 75 Republic 10 Republic 11 Republic 11	11/2 2 2 1/2 3 3 1/2 5 5 6 6 11/2 1 1 1/2 2 1/2 3 3 4 5 5 1		31-5x5 31-5x5 31-5x5 31-5x5 11-5x5	35x5n 34x33,3 34x4 34x4 36x5 36x6 36x6 36x6 36x6 36x6 36x3,3 36x5 36x3,3 36x5 36x3,3 36x5 36x6 32x4,3 36x5 36x6 33x7n 36x5 36x6 33x5 36x5 36x6 36x6 36x6 36x6	36x4d	I I I I I I I I I I I I I I I I I I I	Transport	21/2 31/2 5 6 2 21/2 31/2 2 31/2 2 31/2 2 3 31/2 2 3 3 31/2 2 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	1795 2100 2700 2700 3600a 4300 4500 2750 2950 2950 2950 4550 2000 2475 3475 1595a 1295 1895a 1295 1885a 2285 3485 2285 3485 2285 2400 3500	4 x514 419x514	34x3½k 36x3½k 36x4k 36x4k 36x5k 34x3½ 36x4 36x4 36x6	36x5 36x3\d 40x6d 40x6d 40x6d 40x16d 36x7k 36x7k 36x7 36x7 36x6d 34x4\d 36x7 32x4\d 36x7 32x4\d 36x8 36x8k 36x8k 36x8k 36x8k 36x12k 34x5c 34x6k 36x8k 36x7 36x8k	CWWWWWDDDDDWWWWIIIIWWWWWIIII
Nash. 2018 Nash 3018, LWB Nash 3018, LWB Nash 3018, LWB Nash Quad. LWB Nash Gold Nelson Go	1-11-2-2-21-2-21-2-21-2-21-2-21-2-21-2	1595 2150 2750 2200 2800 2250 3100 3500 1750 2795 3495	334x534 334x534 444x53 334x534 434x534 434x6 446x534 446x534 446x534 446x534 446x534 446x534 446x534 446x534 446x534	34x4 34x4k 36x6 34x4k 36x6 34x4k 36x5 36x4 36x4k 36x4k 36x4k 36x4k 36x4 36x4 36x5	34x5 34x7k 36x5k 31x7k 36x6 36x7 36x5d 40x6d 36x7k 36x8k 36x7k 36x8k 36x7k 36x7 36x5	I I I I I I I I I I I I I I I I I I I	Sanford W-15 Sanford 25 Sanford 35 Sanford 55 Sanford 50 Schacht 2-Ton Schacht 3-Ton Schacht 3-Ton Schacht 5-Ton Schacht 7-Ton Schacht 7-Ton Schacht 7-Ton Schacht 3-Ton Schacht 5-Ton S	21-31 31-5 5-7 2 3 4 5 7 1 1 2 3 3 5 1 1-2 1 1-2 2 3 2 3 3 2 3 3 2 3 3 3 2 3 3 3 2 3 3 3 2 3	3200 3800 4200 4400 5080 1685 3000 4900 2250 3350 4350	4)-2x5)-2 4)-2x5)-2 4)-2x5)-2 4)-2x5)-2 4)-2x6 4)-2x6 4)-2x6 4)-2x5 3)-2x5 3)-2x5 4)-2x5 4)-2x5 4)-2x5 4)-2x5 4)-2x5 4)-2x5 4)-2x5 4)-2x5	36x4 36x5 36x5 36x4 36x5 36x5 36x6 34x4 36x6 34x3 36x6 34x3 36x6 34x3 36x6 34x3 36x6	36x8 40x12 34x5 38x7n 36x7 40x8n	W W	Ultimate. A Ultimate. A Ultimate. A Ultimate. B Ultimate. B Ultimate. B Ultimate. B Ultimate. B Ultimate. B United. A United. C United. C United. C United. C United. S United.	2 2 2 3 3 5 1 1 2 1 2 1 1 1 1 2 1 1 1 1 1 1 1 1 1	3150 3200 3250 3700 3800 5500 2445 3150 3975 4500 2375	3 / 4 x 5 / 4 x 5 / 4 x 5 / 4 x 5 / 4 x 5 / 4 x 5 / 4 x 5 / 4 4 x 5 / 4 x 5	36x314 36x314 36x314 36x3 36x4 36x6 36x6 36x8 36x8 36x8 36x8 36x8 36x8	36x7 36x6 36x6 36x6 36x4d 36x4d 40x12 34x5k 36x5d 40x6d 40x6d 34x5n 36x3d 36x5d 36x5k	WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
Noble. C44 Noble. D50 Noble. E70 Northwestern. W3	2 23/2 33/2 13/2	2700 3500	3%x5% 4 x5% 41%x5% 41%x5% 41%x5% 41%x5%	36x4 36x4 36x5 34x4	36x7 36x8 36x10 36x6 36x8	W W W W W	tion, I—Internal r—8 cyl. s—6 cy k—pneumatic tir a—price includes	Gear,	W—Wor 2 cyl.—al	m. l others are	4 cyl. d	l—dual ti	res.	Velie	11/2 21/2 11/2	1585 2185 2699	3 <sup>3</sup> / <sub>4</sub> x5 4 x5 <sup>1</sup> / <sub>6</sub> 3 <sup>3</sup> / <sub>4</sub> x5 <sup>1</sup> / <sub>4</sub>	36x4k	k 36x5k 36x7k 35x5n	W

<sup>3-</sup>Moreland Road Runner, 4-Nelson Le Moon. 5-Twin City Four Wheel Drive.

#### Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons . Capacity	Chassis Price	Bore and Stroke	Frent	Rear	Final Drive	NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	RES	Final Drive	NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	Rear
Walker-JohnsonA Walker-JohnsonB WalterM WalterS *WatsonC	3 4 1/2 3 2 3 2 1/2 5 1 1/2 2 1/2 2 1/2 2 1/2 2 1/2 2 1/2 2 1/2 1/	\$3699 4200 5395 995 2500 3000 3850 1465a 4250 2450 2450 3250 2400 2400 3250	414x514 414x614 414x614 414x614 414x614 414x614 414x614 414x614 414x614 414x6	36x4 36x5 32x4n 34x3 36x4 36x4 36x6 35x5n 36x5 36x3 36x3 36x3 36x4 36x4 36x5 36x5 36x5 36x5		W W W B W W W W W W W W W W W W W W W W	White 40 White Hick 45 White Hick 45 White Hick H White Hick K Wichita K Wichita M Wichita RX  FINAL DRIVE: tion, I—Internal r—8 cyl. s—6 cyl k—pneumatic tra a—price includes body. —expres Make, trac—tra	dear, t-2 s opti	W-Worn  cyl.—all  onal at e  items of	n, others are xtra cost.	4 cyl. d n—pneu	36x8k	es. les	Wilson H *Wisconsin A Wisconsin B Wisconsin C Wisconsin D Wisconsin E Wisconsin F	1 1 1 2 2 3 3 5 1 1 2 2 3 3 5 5 1 1 2 2 3 3 5 5 1 2 1 2 1 2 2 3 3 5 5 1 2 1 2 2 3 5 5 1 2 2 3 5 5 5 1 2 3 5 5 5 5 1 2 2 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	\$3500 1900 2550 3000 3950 4350 2270 2825 4520 1750 2100 2700 3000 3500 4000 2450 2900	415x814 334x51 414x5 414x5 414x6 434x614 334x6 415x514 415x514 415x514 415x514 415x514 415x514 415x514	36x5k 36x4k 36x4k 36x5k 36x5 36x5 36x5 36x6 35x5 36x6 35x5 36x6n 36x6n 36x6n 36x6 36x6 36x3 26x3 36x3 36x4k	36x5k 36x5k 36x5k 36x5k 36x5dk 40x6d 36x5dk 40x6d 36x5 40x6d 36x5 40x6 40x6 40x6 36x6 40x8 36x10 36x12 36x12 36x18

#### Specifications of Current Farm Tractor Models

TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders; Bare, Strake	Fuel	Plow	TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders; Bere, Strake	Fuel	Plow	TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders; Bare, Stroke	Fuel	Plow
Allis-Chal.G.P. Allis-Chalm Allis-Chalm Allwork2-G	6-12 15-25 20-35 14-28	\$295 1185 1885 1595	4	LeR. Midw. Own	4-31/6x41/6 4-41/6x51/4 4-43/4x61/2 4-43/4x6	Gas. Gas. GorK GorK	1 3 3-4 3	Gray	18-36	1975	3	Wauk.	4-4 <sup>3</sup> / <sub>4</sub> x6 <sup>3</sup> / <sub>4</sub>	Gas.	4	OilPullE	30-60 2½-5	\$225	4 4	Own Own	2-10x12 1-5½x5½		8-10
Allwork C ¶ARO.1921-22 Aultman-T, Aultman-T, Aultman-T, Aultman-T, Avery, SR.Cul. Avery Cult-C	14-28 3-6 15-30 22-45 30-60 5-10	1293 385	4	Own Own Clim. Own Own Own	4-5 x6 1-4½x5 4-5 x6½ 4-5½x8 4-7 x9 4-3 x4	Gork Gas. G,K,D G,K,D G,K,D G,K	3 1 4 6	Hart-Parr . 20 Hart-Parr . 30 Hart-Parr Heider	20 30 9-16 12-20 5-10	628	4 4 4	Own Own Own Wauk. Wauk. LeR.	4-41/4x53/4	K,D. K,D. G,K	2 3  2 3 1	PieneerG PieneerC	18-36 40-75	****		Own Own	4-5½x6 4-7 x8	G,K,I Gas.	4 10
AveryC §Avery Åvery Avery AveryAvery	12-25 14-28 18-6 25-50	****	4 4 4 4	Own Own Own Own Own	6-3 x4 4-4x5½ 2-6½x7 4-454x7	G,K G,K,D G,K,D G,K,D G,K,D G,K,D	2-3	Huber Light, 4 Huber Super 4	12-25	985	4	Wauk. Midw.	4-31/8x41/3 4-41/8x53/4 4-41/8x6	GorK Gas.	3 3	Russell Russell Russell Russell	12-24 15-30 20-35 30-60	****	4	Own Own Own Own	4-414x534 4-5x61/2 4-51/2x7 4-8 x10	GorK GorK GorK	2-3 3-4 4-5 8-10
Avery	45-65	****	4	Own	4-7%x8	G,K,D	8-10	International International International	8-16 10-20 15-30		4	Own Own Own	2-61/2x8	G,K,D G,K,D G,K,D	3	Shaw-Enochs			2	LeRoi	4-31/(x41/	Gan.	
Bates All-StID Bates Mule, H Bates Mule, F BatesMule, G	15-25 15-25 18-25 25-35 25-35	****	4 4 *2 *2 *2	Own Midw. Midw. Midw. Ste.	4-41/8x51/4	Cas	3 3 3	¶Kinkade	114-3	190	1	Own	1-3 x3	Gas.		(Grader)							9
Bear Seeman Jr Seeman Best 30 Best 60 Sest 60 Best	34-11/2 2-4 18-30	180 240 2500	2 4 *2 *2 4	B&S Own Own Own Own B&S Own	4 41/2x6 4 43/4x61/2 1 - 21/2x21/2 1 - 31/2x41/2 4 - 43/4x61/2 4 - 61/2x81/2 1 - 21/2x21/2 2 - 4 x5	G.K.D	4	La Crosse La Crosse Lauson5 Lauson21 LeaderB LeaderN 2LeaderGU	12-13 16-32	1295 1675	2 4 4 4 4	Own Own Midw. Beav. Own Clim. Clim.	2-6 x7 4-41/8x51/4 4-43/4x6 2-6 x61/4 4-5 x6	Gork	1 3 3-4 2-3 3-4 3-4	TeroTracter'22 Townsend Townsend Townsend Trayler Trayler Twin City Twin City Twin City	6-10 10-20 15-30 25-50 6-12 12-20 20-35 40-65	675 800 1350 2500 500	2 2 4 4 4	LeR. Own Own Own LeR. Own Own	4-3½x4½ 4-6½x7 4-7 x8 4-8½x10 4-3½x4½ 4-4½x6 4-5½x6¾ 4-7¾x9	Ker. Ker. Ker. Gas. H, K	2 2-3 3-4 4-8 1-2 3 5-6 8-10
Case	12-20 15-27 22-40 40-72 25 40 5-21/4	1050 1320 2550 5200	4 4 4 *2 *2	Own Own Own Own Own Own Own N Way	4-4½x6 4-5½x6¾ 7 x8 4-4¾x6 4-6½x7 2-2½x5	G,K,D Gas. Gas. GorK	3-4 4-5 8-10 4 6	LincolnB Little GiantB Little GiantA	15-30	1600	4 4	Buda Own Own Wisc.	4-41/2x6 4-41/2x5 4-51/2x6	G,K K K Gas.	3 4 6 16	Uncle SamC20 Uncle SamB19 Uncle SamD21 Utiliter501 Utiliter501A	12-20 20-30 20-30 214-4 214-4	1235 1985 1985 295 340	4 4	Weid. Beav. Beav. Own Own		GorK GorK	2-3 3-4 3-4 1
CletracF CletracW De-It-AllA De-It-All, Jack De-It-All6	9-16 12-20 3-6 6 12	495 395 495		Own Own Own Own Own	4-3/414/ <sub>2</sub> 4-4 15/ <sub>2</sub>	Gas.	2 2-3 1 1	MerryGar1922 Minne All-P Minne Gen.P Minne. Med.D MinneHeavyD Meline Univ D Meline Orch	2 12-25 17-30 22-44 35-70 9-18 9-18 20-30	650	4 4 4 2 2	Evin Own Own Own Own Own Own Own Beav.	4-434x7 4-6 x7 4-734x9 4-334x5 4-334x5	Gas. Gork Gork Gork Gork Gas. Gas. G,K,D	3 3-4 5-6 8-9 2-3 2-3 4	WallisK WaterleeN Wetmere21-22 WiscensinE WiscensinH	15-25 12-25 12-25 16-30 22-40	675 1185 1750 2550	4 4 4	Own Own Wauk. Clim. Clim.	4-4 x53/4 4-5 x61/2	Ker. G,K	3 3 3 4-6
Eagle. F Eagle. H E-B. AA E-B. Q	12-22 16-30 12-20 12-20		4 4 4 4	Own Own Own	4-43/4x5	Gork Gork G,K,D G,K,D	3	NB	20-42 25-50	3000	4	Own Own Own	2-8 x10 2-9 x12	GorK	1 3-6 4-8	Yuba15-25 Yuba25-40	15-25 25-40	2750 4250		Wisc. Wisc.	4-41/4x6 4-53/4x7	G,K,D G,K,D	
Fageol. D Fordson. Frick A Frick C	9-18 -18 12-20	305	4 4 4 4	Lyc. Own Erd. Beav.	4-51/4x7 4-31/2x5 4-4 x5 4-4 x6 4-48/4x6	Gas. G,K G,K G,K	2 2 2-3	OilPull K	35-70 12-20 16-30		4 4	Own Own Own	2-10/2114	K,D K,D	8-12 3 4 5-6	ABBREVIA Distillate. Pl tions. Figures —Beaver. B —Continental Hercules. Le Way. Nor.— Weid.—Weide others are wh	are bar & S—B	riggs	aries 14 in & Str	in relat . plows. atton.	Engine M Clim.—Clir Evingue	ake: Be	ndi- eav. ont.

#### Specifications of Current Passenger Car Models

		PRI	CES	1	-	Base			2-	C.)		3	and	1 3	Type Fe		-	20	atie
2-Pass.	S-Pass.	7-Pass.	Spert	Coupe	Sedan	Wheel B	Tires	Engine Make	Cylinders Bore and Stroke	Rated Herse Power (N.A.C.C.)	NAME AND MODEL	Carburete	Starting	Ignition	Clutch: Ty	Gearret	Universe Type an Make	Rear Az Type an Make	†Gear Ratie
1995c	\$1785 1650 1195 1495	\$1850 1595	\$1885c	\$1995e	\$2485 1450d 1995d		33x4 <sup>1</sup> / <sub>2</sub> 33x4 32x4 33x4	H-S Own Cont	6-3½x5 2- 6-3½x4¼ 6-3¾x4½	29.40 23.44 27.34	AmericanD-66 AmericanSteamer Andersen41 AndersenSeries 50	Zenith	West	L-N West	None s-p B&B	B & B None Durston Durston .	f Universal.	F Salis Own 1/2F Salis 3/4 F Salis	4.50 1.78 4.63 4.63
1785p 1575	2620 1475	2645	(1945c) (1895n) (1995n)	3625 2275	3695 2345	130 121	34x4½ 32x4	Own Cont	8-31/4x5 6-33/8x41/2	33.80	Apperson8-21-S Auburn6-51	Johnson.	Bijur	Remy	m-d Own e-p B&B	Own	m Sterling	1 <sub>2</sub> F Own F Salis	4.2
865	1395 885	725g	1495d		1850d (1395	118 109	32x4 31x4	Cont Own	6-31/sx41/4 4-33/sx43/4		Barley Buick. 1923-34-5-6-7-38	Strom Marvel	Deleo	Delco	e-p B&B m-d Own	Fuller Own	f M&E m Own	½F Col ¾F Own	4.5
1175	1195	975g 1435	(1625a \1675c	1935 1895	\\1325 1985 2195	118 124	32x4½ 34x4½	Own	6-33/8x41/2 6-33/8x41/2	27.34 27.34	Buick 1923-41-4-5-47 Buick. 1923 48-9-50-4-55	Marvel Marvel	Delco	Delco	m-d Own m-d Own	Own	m Own in Own	F Own	
2885	2885	2885		(3675 3750d	(3950 4300	132	33x5	Own	8-31/sx51/s	31.25	Cadillac	Own	Delco	Delco	m-d Own			F Tim	1.
1750b 1185	1790	1990 1345	1950c	1595	2575 2975b (2295 1585	117	32x41/2 34x41/2 32x4 32x4	Cont Cont Own	6-3%x43/2 6-35%x53/4 6-31/4x43/2 6-31/4x43/2	31,54 25,35 25,35	Case         X           Case         W           Chalmers         1922           Chalmers         1922	Rayfield. Strom	Delco	Delco	m-d Own m-d Own m-d Own m-d Own	Own	f Snead f Arvac m Hardy m Hardy f Own	1/2F Col 1/4F Col 1/2F Adams 1/2F Adams	4.4
510	1495e 525	1645 425g	1595a	∫ 840e	(2295d (2375 f 860		33x4 30x3½	Own	6-3½x5 4-3½x4	29.40 21.76	ChandlerSix ChevroletSuperior	Rayfield.	Remy		e Own			F Own	
085b 1385	995	1059d 2685	1260d 2685c	3285b	1485d /3285e  3685 f		31x4 33x5	Own Nort	6-3-1-x41/2 8-31/2x41/2	22.50 39.20	Cleveland	Holley.) Strom Johnson.	A-L	Bosch Deleo	s-p B&B m-d North	Own	m Mech m Spicer	12F Own 34F Col	4.5
995	1475 985 1395	1095d 3500	1395c 1495c 3500c	1965b	1995d 1395d	115 116 138	32x4 31x4 32x4 33x4½ 33x5 33x5	Cont Cont Falls. Cont Cont	6-31/8x41/4 6-31/8x41/4 6-35/8x51/4	23.44 31.54	Columbia. Big Six Columbia. Light Six Courier. 23-6-60 Crawford. 23-6-70 Cunningham. V	Strom Strom Strom Zenith Zenith Strom	West West	A-L A-K Bosch	s-p B&B s-p B&B m-d B-L	Durston Muncie.	m Spicer m Spicer f Flexite m Spicer m Spicer f Spicer f Spicer	34F Col	5.6
1350b 1495b 1595 1175 850	4350e 1295 1595 1175 880 3950c 865	4350 1295e 3950	1495c 1695	[5350e 1795e 2095 1545 980b 4985e (1240	6000 1795d 1595 1195d 4310f (1370	120 112	33x5 31x4 32x4 32x4 32x4 33x5 31x4	Own Cont Cont H-S Own Own	6-31/x 41/4 6-33/6x 41/2 4-31/2x 5	39.20 23.44 27.34 19.60 24.03 38.40 19.60	Daniels	Strom Strom Strom Strom Stewart. Strom Carter	Delco Delco Dyneto N.E: West	Delco Eisemann. N.E Bosch	s-p B&B s-p B&B s-p B&B m-d Own m-d Own	Warner. Warner. G-L Own	m Peters f Hardy m Own m Spicer	F Peru.	5. 4. 4. 4.
990	990		(1015)		1070k 1195 11495	115	31x4	Falls	6-31/8x41/4		Dort25-20	Carter.	Bosch	Bosch	m-d Detlaff	Own	m Mech	34F Flint.	
890 890 1600	890 1650	*****		7800e 1365 2250	7800b 1365 2400	109	33x5 31x4 32x4}	Own Cont Anst	8-27/sx5 4-37/sx41/4 6-31/4x41/2	26.45 24.03 25.35	DuesenbergStraight 8 Durant	Till	A-L	A-L	8-p Own	Warner.	f Climax m Spicer m,f Spicer	%F Adams	8 4.
1485 1395 1125c	1095 965 1395 1125 1045		1165d 1395 1165	1795e 1975 1695 1145	1795d 1425d 2065 1645 1245k	112 118 118	32x4 31x4 33x4 33x4 32x4	Own Lyc Cont Falls Own	4-3 74 x51/4 4-31/2 x5 6-33/6 x41/6 6-31/6 x41/4 4-38/6 x5	18.91 19.60 27.34 23.44 18.23	Earl	Strom Strom	Delco Delco West	Delco Wagner	m-d Warner . s-p B&B	Muncie. Warner. Mech.	m Spicer m Mech	1/2F Own. 3/4F Salis. 3/4F Salis. 3/4F Col. 1/2F Own.	4.
269 r	2988	235g		530	{595 725	100	30x31/2	Own	4-3%x4	22.50	Ford		Own	Own				1/2F Own.	
900	3900 1950		*****	4900 2750c			32x43 32x4	Own	6-33/4x4	27.34 25.35	Fox7F Franklin10	Own	1000	A-K	»-р В&В	Own	1	12F Own.	. 4.
965 490	965 490			1115k	760d	100		Lyc Own	4-35/8×4	21.76 21.03	GardnerT-R & G	Scoe	. West	West	m-d Own	Own	m Mech m Mech	1/2F Tim	. 3
24 <b>75</b> 1595 2395	2475c 1595 1345 p2550c	2650 1345c (2395	1	1950   3095	1950 33951	125 121 115	32x4 32x4 32x4 32x4 33x5	Weid Own Cont H-S Own	4-3% x51/4 4-41/8x41/4 6-38/8x41/4 4-31/2x5 6-31/2x5	19.60	Hatheld	Strom Till Marvel. Zenith Strom	Delco Delco Delco Dyneto L-N	Delco Delco Conn King	m-d B-L m-d Warner. s-p B&B s-p B&B s-p Warner.	Warner. G-L G-L Own	m Spicer m Spicer m Universal. m Spicer m Universal.	F Tim F Tim F Col	4 4 5
	(1595 11850p 2500 c	2500		3390c	2595 2695p 3600f	126	34x414	Own	6-31/4x41/	29,40	HolmesSeries 4	Strom	Dyneto	Eisemann.	m-d B-L	B-L	m Universal.	34F Tim	. 1
1150	1425 c 1150	1475	1250a	25700	1785			Own		29.40 16.90							m Universal.		
995b 189 <b>5</b>	995	1685	1095	1335h 2985 14456 2785	2985	121 112 120 124	32x4 <sup>1</sup> / 31x4 32x4 32x4	Cont Own Own	6-314x5	25.35 26.38	Jackson. 638 Jewett. Six Jerdan MX Jerdan H	Strom	. Remy Delco	. A-K Delco	m-d Long s-p Detroit.	. Warner. Detroit.	f Snead m Mech m Spicer m Universal	. 1/2F Tim	4
5000	985 985 1525 5000	5250		5000	1450 1450 2175 6000	111 111 118 130	32x31	Gray Gray Walk'i Own Own	4-31/2x5 4-31/6x5	19.60 19.60 23.44 28.80	Kelsey	Scoe Scoe Strom	Bosch Bosch	Bosch	f-d Own s-p B&B f-d Own	. f-d Own Detroit. f-d Own		Own.	. 4
1495	1495 1885	2385	2385		2400 2550	120	32x41 32x41 32x41	Own. Own. Own.	8-3 x5 8-3 x5 6-3 x5	28.80	KingK	Ball&B.	.   West	. A-K	. s-p Detroit.	. Own	f Hardy f Hardy m Spicer	. F Col	. 4

#### MISCELLANEOUS

- MISCELLANEOUS

  a-2 Passenger, d-5 Passenger,
  b-3 Passenger, c-6 Passenger,
  c-4 Passenger, d-7 Passenger,
  g-Chassis Price,
  h-All Metal Type,
  k-Soft Top Type,
  n-Tire Sige 32x42,
  p-Sport.
  r-Price without starter and demountable rims. Price, complete, \$364.
  e-Price without starter and demountable rims. Price, complete, \$393.
  †Standard Phaetons.

#### ENGINE

- ENGINE
  Anst—Ansted
  Cont—Continental
  D. Ly—Dort Lycoming
  H.S—Herschell-Spillman
  Lyc—Lycoming
  Nort—Northway
  Walk'r—Walker
  Weid—Weidely

### CARBURETOR Ball & B—Ball & Bail Till—Tillotson Strom—Stromberg Y & T—Yale & Towne

- CLUTCH
  f-d—Friction drive
  c—Cone
  m-d—Multiple disc
  s-p—Single plate
  B & B—Borg & Beck
  B-L—Brown-Lipe
  North—Northway
- (Continued on page 78)

STARTING, LIGHTING
IGNITION
AL—Auto Lite
G-D—Gray & Davis
L-N—Leece Neville
N. E.—North East
West—Westinghouse

GEARSET
f-d—Friction Drive
B-L—Brown-Lipe
G-L—Grant-Lees
Mech-Mechanics
North—Northway

UNIVERSAL.

(-fabric
m-metal
M&E-Merchant & Evans
Mech-Mechanics

REAR AXLE
F—Floating
1/4 F—Semi-Floating
2/4 F—Three-Quarter
Col—Columbia
Salis—Salisbury
Std—Standard
Tim—Timken



## CADILLAC

The Cadillac Dealer counts it his most valuable asset that his continued good fortune and well being are secured not only by Cadillac leadership in the fine car field but also by the almost limitless resources of the General Motors Corporation.

CADILLAC MOTOR CAR COMPANY, DETROIT, MICHIGAN
Division of General Motors Corporation



Standard of the World

#### Specifications of Current Passenger Car Models

		PRI	CES			Base			-	Herse .C.)		1	pus		Type		20	÷-	1
2-Pass.	5-Pass.	7-Pass.	Spert	Coupe	Sedan	Wheel B.	Tires	Engine Make	Cylinder Bere and Stroke	Rated H Power (N.A.C.(	NAME AND MODEL	Carburete	Starting Lighting	Ignition	Clutch: and Ma	Gearsot	Universi Type an Make	Rear As Type an Make	
1985 1695	1695	\$4090 [1795	\$2045d	\$5500 2345e		132 123	33x5 32x4½	Own Anst	8-31/x51/ 6-31/x41/2	33.80 25.35	LaFayette23	Johnson. Rayfield.	Deleo G-D	Deleo Conn	m-d Own m-d Ansted	Own Warner	m Own f Snead	F Own.	4 5
575	1395	12095	1575	2085 1695k	\2145d 2245	117	32x4	Own	6-31/4x5	23.44	Liberty10-D	Strom	Wagner	Wagner	s-р В&В	Detroit	m Spicer	1/2F Tim	. 4
800 800g	3800c 7600c	3800 7600		4400d 10500	4700d 11000	136 142		Own	8-3%x5 6-4½x5½	36.45 48.60	LincolnSeries 8	Strom Ball&B	Deleo West	Delco	m-d Own m-d Own	Own	m Spicer m Own	F Tim F Own.	
385 885	3185e 885	3185		3985 985	4385 1335	136 109	32x41/2 31x4	Own	6-3 <sup>3</sup> / <sub>4</sub> x5 <sup>1</sup> / <sub>8</sub> 4-3 <sup>5</sup> / <sub>4</sub> x4 <sup>1</sup> / <sub>2</sub>	33.75 21.03	Marmon34 Maxwell		Deleo	Delco Simms	m-d Own	Own	m Spicer	%F Own.	3
300 350	6300e 3950e	6300 3950e		1235 7500 4850	7500 5250	140 132	33x5 32x4½	Own	0-41/2x6 4-33/4x63/4	48.60 22.50	McFarlan1922 MercerSeries 5	Rayfield.	West	Splitdorf	e-p B&B m-d Own	B-L	m Peters	F Tim	
95	3750 1895	3750		5000	5000	132 119	99-412	Own	6-334x5 6-314x41/2	33.75 25.35	Marcar	Strom Strom	Delco	Eisemann Delco	а-р В&В	Muncie.	m Peters m Spicer f Snead	F Col.	
190b		1690	1850c	2050c	2275d	127	32x4 32x4 32x4 32x41/2 32x41/2	Own	6-31/2×5 6-31/2×5	29.40	Merit. Mitchell F-50 Mitchell F-50 Monroe 1922-S-9	Strom	Remy	Remy	8-p B&B	Own	m Own	F Own	я
50	950 (1295 1445p		1445	1585e	(1695 1895p	115	31x4	Cont	4-31/4x41/4 6-31/8x41/4		Meen6-40	Strom	Deleo		1		m Universal m Spicer		1
	1785		1995	2585	2485 f 2685 f	128	33x4½	Cont	6-3%x4}4	27.34	Moon6-58	Strom	Delco	Delco	B&B	B-L	m Spicer	1/2F Tim	1
10	1240	1390	1395¢ 1645	18900		127	33x4 34x4½	Own	6-314x5 6-314x5	25.35 25.35	Nash691-96-97 Nash692-94-95	Marvel.	Delco	Delco	s-p B&B s-p B&B s-p B&B	Own	m Own m Own	1/2F Own. 1/2F Own. 1/2F Own.	П
15 75b	935 2475e	(2375		1385h 1195k 3250c	\1275k	200	33x4 32x41/2	Own	4-3%x5 6-31/x51/4	18.23	Nash Four41-4		Deleo		в-р В&В		m Own	F Col.	
00	2500~ 2500	3150 2600e		\3725c				Cont	6-314x414 6-314x514	25.35	Noma3C Noma1D	1	100000000000000000000000000000000000000		*p B&B	1	m Spicer	14F Tim 14F Tim	
75	995	795g	1165	/1445d	1545	115	32x4	Own			Oakland6-44			Remy			m Mech		
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400		0.000		4000			33x5	Own	6-33415	33.75	Winton40	Rayfield	d. Delco,	. Deleo	. m-d Warner	. Warner	f Climax	. %F Tim.	

MISCELLANEOUS
a-2 Passenger, d-5 Passenger
b-3 Passenger, e-6 Passenger, e-6 Passenger, e-6 Passenger, e-7 Passenger, e-10 Pas

ENGINE
Anst—Ansted
Bea—Beaver
Cont—Continental
Dues—Duesenberg
H-S—Herschell-Spillman
Lyc—Lycoming
Supr—Supreme

CARBURETOR
Ball & B—Ball & Ball
Till—Tillotson
Strom—Stromberg

CLUTCH
c—Cone
f-d—Friction drive
m-d—Multiple disc
s-p—Single plate
B & B—Borg & Beck
B-L—Brown-Lipe

UNIVERSAL f-fabric

m—metal M&E—Merchant & Evans Mech—Mechanics

REAR AXLE
P—Floating
1/4 Floating—Semi-Floating
1/4 F-Three-Quarter Floating
Col—Columbia
Salis—Salishury
Std—Standard
Tim—Timken

k—Soft Top Type,

h—Tire Size 32x4½,

p—Sport.

t—Price without starter and demountable rims. Price, complete, \$414.

p—Price without starter and demountable rims. Price, complete, \$414.

p—Price without starter and demountable rims. Price, complete, \$414.

p—Price without starter and demountable rims. Price, complete, \$443.

p—Rice CHANGES: Hupmobile two passenger \$1115, five passenger \$1115, coup \$1535, roadster coupe \$1385, sedan \$1675.



#### A Complete Line

Spencer-Smith Pistons are built for practically every model of car, truck and tractor.

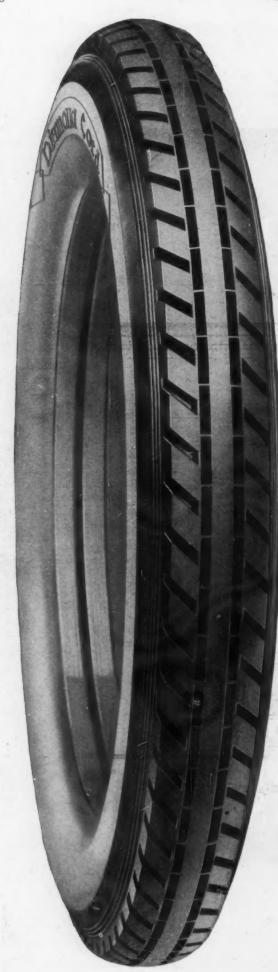
A stock of more than 200,000 finished pistons is maintained at the factory in addition to jobbing stocks in all principal cities.

SPENCER - SMITH MACHINE COMPANY HOWELL MICHIGAN

Largest Manufacturers of Pistons Exclusively



SPENCER-SMITH PISTONS





## Are Tire Buying Habits Changing?

YES, very decidedly.

In 1922 motorists began to put two and two together and concluded that buying established tire quality at fair prices was the best economic policy.

The evidence?

The sales record of an organization whose reputation for making and selling tires of quality has been established by thirty years of service.

This record shows:

In 1922 Diamond Tire Sales were more than twice those of 1921

Don't stock tires of uncertain quality in 1923. Become a Diamond Distributor and sell what is demanded—dependable tire quality.

THE DIAMOND RUBBER COMPANY, INC. Akron, Ohio

FOR PASSENGER AND COMMERCIAL VEHICLES

Diamond TIRES



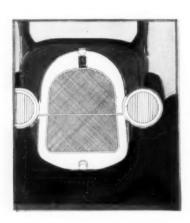
#### ANNOUNCING

UNDER A NEW MARK

NEW MODELS AND NEW PRICES

## STEPHENS

MOTOR · CARS



#### Meeting Buyers' New Demands for Finer Cars at Lower Prices

Motor car owners have declared for a brand new deal in the design, manufacture and pricing of American cars.

They have scrapped the old notion that an automobile must carry a luxury price in order to measure up to their personal requirements.

They are buying cars now with a keen eye for all that makes value and a settled determination to get the best value the market affords.

They are making no compromise on essentials — on performance, distinction, solid comfort, smooth operation, lasting quality and economy.

But they are giving *economy* its real meaning. Not merely more miles per gallon of gas but also more miles per dollar of purchase price, tire cost and running expense.

The 1923 Stephens line has been designed and built to meet this urgent demand of buyers for high-quality, fair-price, distinctive motor cars.

#### Two distinct models, seven individual body types

Skillful engineering, cash buying and efficient manufacturing have worked together to produce better and finer cars at prices materially lower than in 1922.

The dealer's profit remains substantial. His cost of doing business is as great as ever. He is entitled to a legitimate profit. Without it, in fact, he cannot build permanent organization or supply satisfactory service to owners.

For the first time, Stephens presents two distinct models, carrying seven individualized body types. Three of these—a powerful 7-passenger Touring car, a luxurious 7-passenger Sedan and an intriguing new sport "Foursome"—have a longer wheel base, 124 inches, and many extra-large chassis units.

To complete the line and cover every personal transportation need, there is a stalwart 5-passenger Touring car, a graceful 5-passenger Sedan, a smart Touring Sedan, seating five grown-ups, and a sleek and rangy Roadster. Every 1923 Stephens is the best car of its type we have ever built. With forty-two important improvements and refinements over last year's model, the Stephens line sets a standard of motor car values never approached before.

#### Stephens chassis units give index to character of cars

Consider first the standard chassis units bought from outside sources. No other automobile within \$350 of the Stephens price range uses so many high-grade units in extra large sizes. Check and compare this remarkable list: Stephens-Delco ignition, starting and lighting. Timken axles and Gemmer steering gears, both over-size. Mather full chrome-vanadium springs. Fedders thin-core radiator. Stromberg carburetor. Borg & Beck clutch, with pressure-oiled bearings. Saal chassis lubrication. Over-size cord tires, all non-skid.

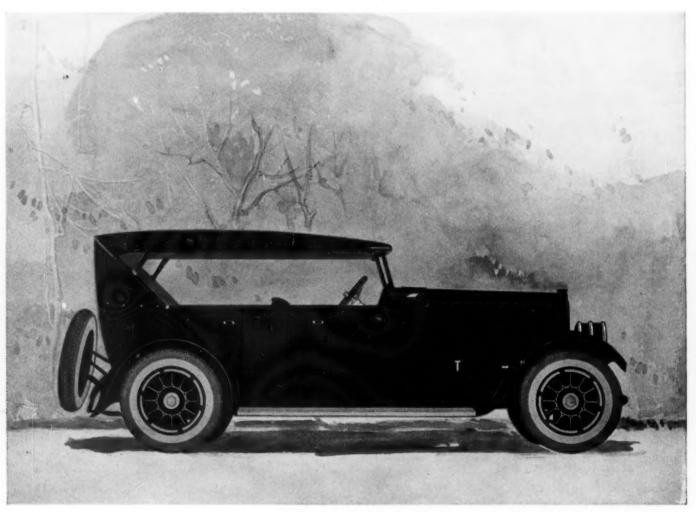
Then ask any Stephens owner and he will tell you that the Stephens 6-cylinder, overhead valve motor, with its intake manifold entirely inside the cylinder head, is of more importance to him than any group of standard units Rated 25.3 horse-power, it develops 59 horse-power when you need it. No American motor is more flexible, more economical, swifter in acceleration or better built. And Stephens chassis units match it in character and efficiency.

#### Stephens bodies are hand built and hand finished

Stephens bodies are hand-built of highest grade materials, fitted and finished by the same careful methods that custom coach makers use. Their quiet comfort lasts as long as the 100,000-mile Stephens chassis itself. Their low-swung, graceful lines, colorful contours and lustrous finish give them real distinction. Each step in the development of these new Stephens models has been conceived in terms of performance, utility and endurance—in ability to take the owner anywhere, swiftly, safely, restfully and with justified pride in his car. This also sums up the new standard set by discriminating buyers. For the manufacturer and dealer who can meet it and satisfy it, a great year is assured—with greater years to follow. 1923 Stephens cars, we know, measure up to and surpass every transportation demand of the most exacting owners.



Vice-President and General Manager



STEPHENS TOURING CAR-FIVE PASSENGERS

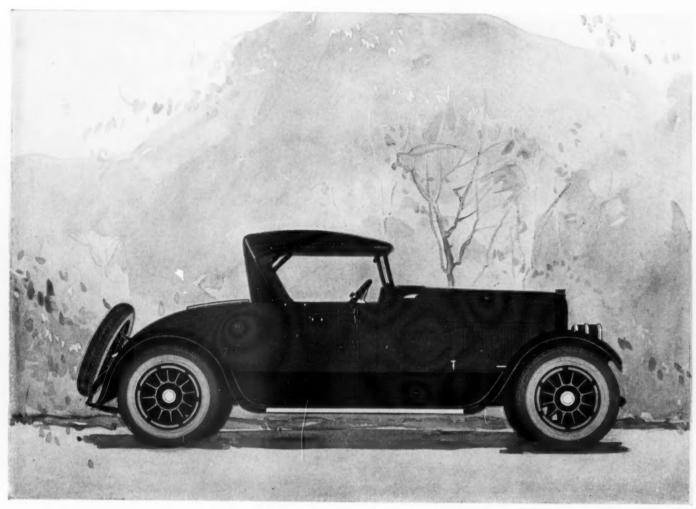
ROBUST power and endurance speak in every virile line and contour of this Stephens Touring Car. With a wheel base of 117 inches and extra long rear springs to build on, Stephens engineers and craftsman have provided a body both spacious and comfortable.

Seats are broad and low—of sensitive spiral springs and curled hair under high grade, long-grain black leather laid in French plaits. The driver's seat is 41 inches wide and 18 inches deep; the rear seat 44 inches by 20 inches. Both cushions are pitched 4 inches higher at front. Leg room is generous. Pedals are adjustable. Plenty of head room, too.

Doors are wide, 21½ inches, individually fitted, with silent hinges, rubber bumpers and special door locks to eliminate noise. 18-inch walnut steering wheel.

Body finish is lustrous starlight blue, with hand fashioned fenders, aprons and radiator in black enamel, and wheels in natural hickory. The clear-horizon top of special fabric is hand-tailored, with extra large glass panel in rear curtain. Unusual equipment includes rain-proof cowl ventilator, marine cowl lamps, barrel headlights, stop light, Kellogg power-driven tire pump, Stewart 75-mile speed-ometer, transmission lock, Saal pressure chassis oiler and full set of tools.





STEPHENS ROADSTER-TWO-THREE PASSENGERS

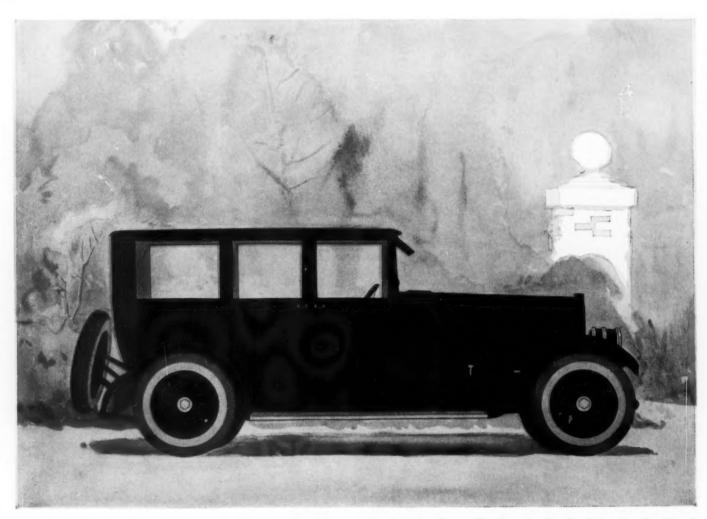
A GALLANT, companionable personal utility car, the spirited performance of the Stephens Roadster gives even business errands the zest of recreation and release from humdrum grooves. Instant throttle response gives you 50-mile speed in 20 seconds when you want acceleration—and exhilaration.

Made for two – comfortable even for three – its hand fashioned body combines restful ease with lines of power and speed. The low lounge seat is 39 inches wide and 19 inches deep, constructed of individual coil springs under curled hair and genuine long grain black leather. 18 inch walnut rim wheel.

The striking Sorrento blue body is set off by the black enamel of radiator, fenders and aprons and natural wood wheels. Added sparkle is given by the silvery headlight bands, parking lamps on cowl and rear deck guards of aluminum. Clear-horizon top, khaki, with khaki lining and large window at rear. Over-all height 7058 inches. Pockets in both doors.

The one-piece windshield is rainproof, as is also the cowl ventilator. Two baggage spaces are provided—a large one under rear deck for bags and a locked compartment behind the seat for parcels. Equipment is complete, from transmission lock to Stephens special stop light.





#### STEPHENS SEDAN-FIVE PASSENGERS

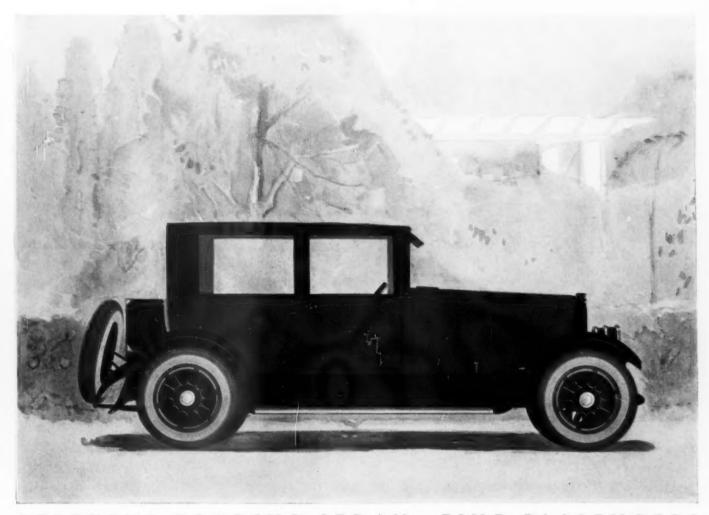
SUBSTANTIAL and roomy comfort, united with balanced light weight and unfaltering power, make the Stephens 5-passenger Sedan a supremely satisfying enclosed car for city and suburban use. The front seat is 43 inches wide by 18 inches; rear seat 45 by 20 inches.

The body finish of rich starlight blue—with radiator, fenders and aprons in black enamel—is relieved by the polished headlight bands, hub caps and door handles. Wheels are blue. Upholstery is deep nap, all wool broadcloth in dark two-tone beaver brown. Fittings in matt silver finish. Instrument board and window openings are natural walnut.

Doors are wide, 24 inches, and fitted with three hinges, double catch lock plates, and two dovetail bumpers. Balanced plate glass windows in doors are lifted and lowered by quick action crank type regulators. Rear quarter windows, also plate glass, have notched lifts.

Complete equipment insures your safety and comfort. Big and burly cord tires, all non-skid, cowl ventilator, sun and rain visor, dome light, stop light, Perfection heater with heat control, robe rails, silk window curtains, double windshield wiper, rear view mirror, Stewart 75 mile speedometer, Kellogg powerdriven tire pump and transmission lock.





#### STEPHENS TOURING SEDAN-FIVE PASSENGERS

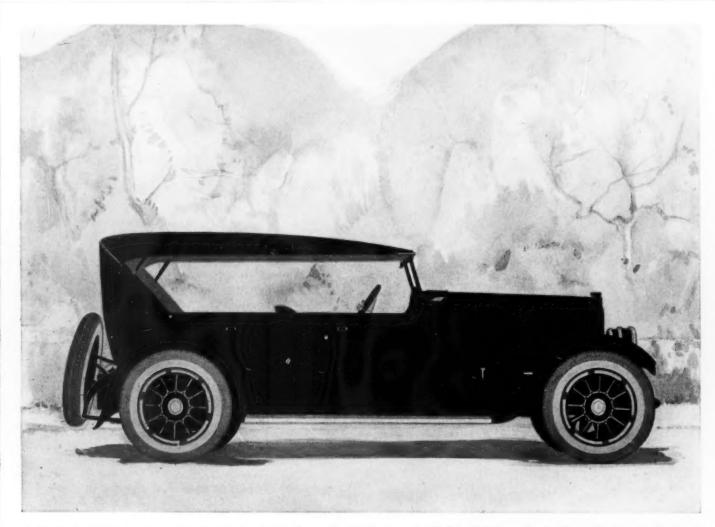
A MASTERLY all-seasons, enclosed car for business and professional men and for women who prefer the greater intimacy and economy of a close coupled body type. The relatively light weight of the Touring Sedan gives it the speed range and dependability of a touring car for winter or spring driving.

Entrance and exit are made convenient and easy by the broad doors, 29 inches wide. Both front seats fold down at right angles to the floor. They are 18 inches square, and, like the rear seat, are built up on a foundation of small coil springs and curled hair. The rear seat

Upholstery is cut velour in a rich, warm taupe, with top lining to match. Fittings are in matt silver finish. Instrument board and window mouldings are walnut. The body is in Sorrento blue, with black radiator and fenders, and hickory wheels. Top is bright black duratex over standard top panels; touring trunk to match. Lamp bands and hub caps are of polished nickel.

Complete equipment includes roomy trunk, rainproof cowl ventilator, sun and rain visor, dome light, stop light, Stewart 75 mile speedometer, Kellogg power-driven tire pump, transmission is 44 inches broad by 21 inches deep. lock and big cord tires, all non-skid





#### STEPHENS TOURING CAR - SEVEN PASSENGERS

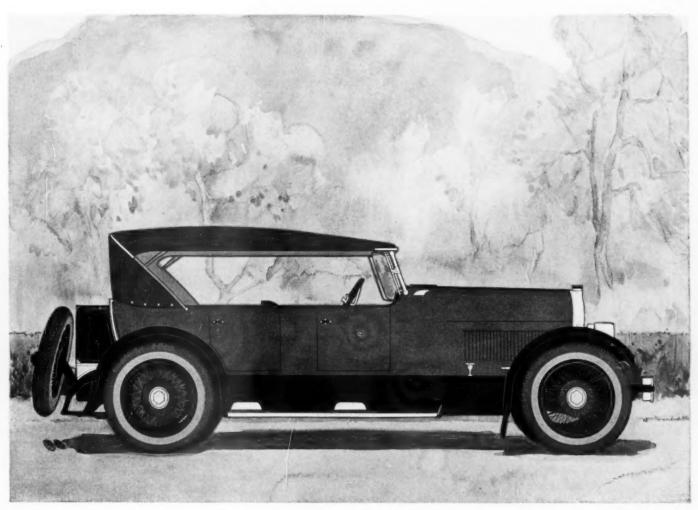
an extended wheel base - 124 inches a heavier frame and 571/2-inch rear springs; it also incorporates many standard chassis units of a size and quality used in no other car selling under \$2000.

Stephens-built throughout, the flexible, valve-in-head motor develops 59 horse power when you need it for hills or ioned body seats seven. Cushions are of high grade, small coil springs and curled hair under hand buffed leather. wide and 19 inches deep in front; at let kit and full set of hand tools.

THRIFTY and powerful, this big the rear, 43 by 21 inches. Two broad Stephens Touring car not only has auxiliary seats fold into compartments. Doors are wide, 211/2 inches, with pockets and tubular weather beading about openings. Clear-horizon top is hand tailored, black, with khaki lining. Two piece wide-vision, ventilating windshield.

Equipment is unusual—motor thermometer on dash, cowl ventilator, marine type parking lights on cowl, large barrel heavy winter roads. The hand fash type head lamps, stop light, transmission lock, Kellogg power-driven tire pump, Stewart 75-mile speedometer, Saal high pressure chassis oiler, 33 x 412 non-skid Seats are luxuriously low -39 inches cords, tonneau lights, electric horn, toi-





"FOURSOME"-FOUR PASSENGERS

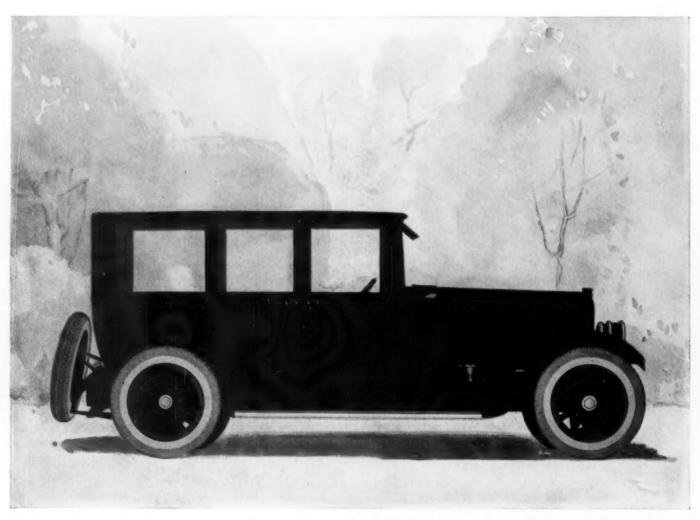
PATRICIAN among sport models, the Stephens "Foursome" is distinguished in performance and alluring in color and form. It unites ease of control, flexible power and instant throttle response with a balance, a low center of gravity and an absence of vibration, which give confidence and the thrill of mastery at mile-a-minute speeds.

The fawn gray of its body finish contrasts boldly with the black fenders and aprons. Its sweeping lines and Apple green wheels and a clear-horizon light, toilet kit and touring trunk.

top of mellow khaki with natural wood bows, complete the alluring picture. The seats are broad and inviting, upholstered in hand-buffed black leather laid in French plaits. Front seat is 39 by 18 inches, rear seat 42 by 20 inches. Wheel base is 124 inches, rear springs 57 1/2 inches.

Three-quarter running boards with aluminum kick plates, individual front fenders, two locked compartments and a tonneau clock on the back of the front seat are some of its visible refinements. contours are accented by the flashing All standard Stephens equipment, plus nickel of radiator, headlights, cowl lamps, windshield wings, motor thermometer windshield standards and hub caps. on dash, bumper, transmission lock, stop





#### STEPHENS SEDAN - SEVEN PASSENGERS

LUXURIOUS comfort is the commanding quality of this Stephens Sedan for seven passengers. With 59 horse power under the hood, a wheel base of 124 inches, and 57½-inch rear springs, it has proved its ability to master any weather or highway conditions.

Finish is starlight blue and black, with silvery accents in head and cowl lamps, hubs and door handles. Upholstery is deep nap broadcloth in two tones of beaver brown with crayon stripes of blue. Interior fittings are matt silver finish. Natural walnut window mouldings and instrument board, the latter with compartment for gloves or parcels.

Cushions are of resilient coil springs and deep curled hair. The front seat is 41 by 19 inches; the rear seat 45 by 21 inches. The four doors are large, 26 inches wide, fitted with noiseless dovetail bumpers. Windows are of plate glass, with positive crank regulators.

Equipment is exceptional, including Stephens stop light, motor thermometer on dash, dome and corner lights, Perfection heater, flower vase, vanity case, smoking set, robe rails, silk curtains, silk hat cord, double windshield wiper, rear view mirror, sun visor, cowl ventilator, 33 x 4½ non-skid cords, 75 mile speedometer, Kellogg power-driven tire pump.



#### CHASSIS AND BODY SPECIFICATIONS

Motor Stephens overhead valve, 6 cylinder. 34-inch bore, 44-inch stroke. Developing 59 horse-power at 2750 revolutions per minute, its intake manifold is entirely inside the cylinder head and forms a superheating and tempering gas chamber of revolutionary efficiency. Grilled by the exhaust from all six cylinders, this manifold "cracks" every heavy particle of gasoline and turns it into high-power gas radiant with explosive force. A water-jacket holds the gas at a temperature range and density where maximum power, instant acceleration and unfailing economy meet and satisfy every demand you can make on a motor car.

Crankshaft Large, 2% inch, balanced statically and dynamically. Connecting rods heat-treated. 1 inch hardened steel piston pins. Light, close-grained iron pistons with piston rings hand fitted. Alloy steel valves, 1% inch opening, % inch lift. Dual valve springs. Quiet valve rocker arms, ball and socket bearings individually ground to fit. Crankshaft and connecting rod bearings are hand fitted and scraped in.

Cylinders Piston fits are accurate within three tenthousandths of an inch. Such care and precision in construction is not excelled in the highest-priced cars of foreign or American make.

Forced feed lubrication to all motor bearings, automatic vacuum control, synchronized with motor load.

Ignition Delco starting, lighting, ignition; semi-automatic spark control. 113 amp.·hr. battery.

Fedders thin-core radiator. Oakes ball bearing fan. Thermosiphon cooling. Stewart vacuum fuel system.

Stromberg carburetor. Exhaust heated air intake.

Clutch 10-inch Borg & Beck dry plate, adjustable. Throw-out bearing positively lubricated. Large clutch brake. Clutch pedal adjustable. Requires little effort to release. Unusually smooth in operation.

Transmission Stephens-Special. SAE standard gear-shift. New Departure ball bearings on drive shaft. Quiet gears of tough nickel steel. Universal Joints. Silent bearing type, oil lubricated. Enclosed in oil-tight, dust-tight and water-tight housings.

Rear Axle Oversize Stephens Timken. Quiet, spiral-bevel drive. Timken roller bearings, adjustable. Oil-tight housing. 5.5 to 1 reduction on Numbers 24, 26 and 27. 5.09 to 1 reduction on Numbers 15 and 18. 4.66 to 1 reduction on Numbers 12 and 16.

Front Axle Stephens-Timken. Extra size for super strength. Timken roller bearings, adjustable. Oil lubricated steering yoke bearings.

Steering Gear Oversize Stephens Gemmer semireversible worm and gear type, 9.5 to 1 reduction. 18-inch walnut wheel. Ball bearings reduce steering effort to a minimum. Spark and throttle controls on Numbers 24, 26 and 27 are latest lever type. Wheelbase 124 inch on Numbers 24, 26 and 27. 117 inch on Numbers 12, 15, 16 and 18. Bodies are low swung.

Frame Rigid type. Hydraulic-pressed steel, straight side rails: 7-inch channel section on Numbers 24, 26 and 27, 6-inch channel section on Numbers 12, 15, 16 and 18. Five rigid cross members. Torsion tubes 2 inches in diameter at both front and rear. This rigid frame construction eliminates body weaving, squeaks and noises.

Springs Mather chrome-vanadium throughout. Long-lived and flexible, unusual length for riding comfort. Action of front and rear springs harmonized to absorb road shocks. 57½ x 2½ inch rear, 37½ x 2 inch front on Numbers 24, 26 and 27. 56 x 2 inch rear, 37½ x 2 inch front on Numbers 12, 15, 16 and 18.

Brakes Emergency brake 8 x 2½ inches at the rear of the transmission. Service brakes on rear wheels—15½ inch drums, oil·less brake mechanism lubrication. Stephens brake drums are turned true after being mounted on the wheels. This precautionary measure is assurance against eccentric brake drums—the cause of uneven braking and consequent skidding.

Tires Oversize non-skid cords on all wheels, 33 x 4½ inches on Numbers 24, 26 and 27; 32 x 4 inches on Numbers 12, 15, 16, 18. Stanweld demountable rims.

Body
Stephens bodies are constructed and finished of the same materials and by the same hand methods which custom body-builders use. The substantial frame is of straight-grain hard wood, air-seasoned before it enters the drying kilns. Every part is cut to form; nothing is steamed or bent. Joints are screwed and glued. Body panels are hand-shaped and individually fitted—as also are all doors. Stephens quiet comfort lasts as long as the marvelous Stephens chassis itself.

Equipment Transmission lock, Kellogg power-driven tire pump, Stewart 75-mile-per-hour speedometer, cowl ventilator, electric horn, stop light, monogram headlight lenses and large barrel-type headlights, Saal high-pressure chassis oiling system and special additional equipment on the sport and enclosed models. Such completeness of equipment is entirely in harmony with the high-class design and construction hidden under the hood and behind the body panels.

## On the first pneumatic tires— and the latest

The first pneumatic tires made in the United States were equipped with Schrader Valves.

These valves have been constantly improved in design so that today, as in the past, the Schrader Universal Tire Valve is standard for practically all pneumatic tires made in the United States and Canada.

> This means a wide market for Schrader Tire Pressure Gauges and Schrader Tire Valve Accessories, which are made for use with Schrader Valves.

#### What this means to dealers

Dealers in automobile accessories have a waiting market for Schrader products right at their doors. Car owners everywhere need these products. Often, the mere mention of them will make a sale.

#### Visit the Schrader Exhibits at the National Auto Shows

By examining Schrader products you will understand better why dealers can make worth-while profits in selling them.

Schrader Universal Products will be exhibited at both the New York Automobile Show, Jan. 6th to 13th (Space C-24); and the Chicago Automobile Show, Jan. 27th to Feb. 3d (Space 31). Make a point of visiting one of these displays.

There's no reason, however, why you should wait until then to see or lay in a stock of Schrader Universal Products. Get them from your supply house now.

Manufactured by A. SCHRADER'S SON, Inc., Brooklyn, N.Y. CHICAGO TORONTO LONDON

Manufacturers of Schrader Valve Insides and Valve Caps, Packed in Metal Boxes of Five Each



Schrader Tire Pressure Gauges

Enable the car owner to measure accurately the air in his tires. Make guessing about air unnecessary. Compact, durable, easy to operate. Packed in boxes of ten. At retail \$1.25 each (in Canada, \$1.50).

SCHRADER TIRE-PRESSURE-GAUGE

#### Sell every car owner these Schrader products

You have only to remind some motorists that they should protect their tire valves and keep their tires properly inflated.

Others must be told for the first time.

By national advertising we are both reminding and telling your customers about Schrader products. This is helping to give dealers easy sales and worth-while profits.



Prevent dirt and mud en-tering the valve. A rubber cap washer seals in the air. Packed in metal boxes of five. Twenty boxes to the carton. At retail 25c per box of five.

#### Schrader Valve Insides

For the car owner who wants a new Valve Inside now and wants extras for , his tool kit. Twenty boxes to the carton. At retail 25c per box of five.

#### Schrader Dust Caps

Protect Valve threads from damage. Combination Rim Nut and Dust Cap Bushing makes attach-ment and removal of Dust Cap easy. Won't shake off.

Order these from your supply house now.

Manufactured by A. SCHRADER'S SON, Inc., Brooklyn, N.Y. CHICAGO TORONTO

> Manufacturers of Schrader Valve Insides and Valve Caps, Packed in Metal Boxes of Five Each

SCHRADER TIRE-VALVE-ACCESSORIES



The Standard Spark
Plug of the World

#### To the Men Who Sell AC's:

As you contribute largely to the success of AC Spark Plugs, we believe you will be glad to know that the plugs which have so well met the requirements both of yourselves and your customers, have also given a wonderful account of themselves under the most severe conditions:

March Los Angeles—250-mile speedway race won by Tommy Milton, using AC plugs. Average speed, 110.8 m. p. h.

April San Francisco—AC plugs used by Harry Hartz to win 150-mile speedway race. Average speed, 111 m. p. h.

Fresno—150-mile Raisin Day Classic captured by Jimmy Murphy. Average speed, 102.2 m. p. h. AC plugs helped.

May Indianapolis—In the 500-mile International Sweepstakes, Jimmy Murphy smashed all previous records and sped to victory with AC's under the hood. Average speed, 94.45 m. p. h.

June Uniontown—Jimmy Murphy, with AC plugs, finished first in 225-mile race—average speed, 102.2 m. p. h.

July Tacoma—First place in annual 250-mile race taken by Jimmy Murphy with AC plugs.

We call these achievements to your notice not to praise ourselves but to let you know that your confidence in AC plugs is fully justified, and to assure you that there will be no decrease in our efforts to keep AC's foremost in quality and dependability.

Aug. Santa Rosa—At Cotati Speedway, Frank Elliott established new world's record for 50 miles. Time, 117.5 m. p. h. He used AC plugs.

Sept. Kansas City—Inaugural Race at new speedway won by Tommy Milton, using AC plugs. He set another world's record of 108 m. p. h. for the 300 miles.

Detroit—Col. Vincent's Packard Chriscraft, AC equipped, won Gold Cupspeed-boatevent.

Mount Cle mens—(Selfridge Field)—All previous international flight records broken by Lieut. Maughan, in AC equipped Curtiss plane, who flew first in Pulitzer Trophy Aerial Race at the terrific speed of 206 m.p.h. for 250 kilometers. Planes finishing second, third and fourth also had AC plugs.

A few days later, General Mitchell, flying a Curtiss Pursuit Plane with AC plugs, established a new mark for the kilometer at 224.05 m. p. h.

In wishing you a Prosperous 1923, we hope that in the coming months you will permit AC Spark Plugs to contribute even more to your success and profits. For we intend to back you up stronger then ever in order to make the complete AC line still more attractive and profitable for you to specialize upon.

Sell AC Spark

#### Your Business and the AC Line

To make a good living you must make money on your business transactions. You have the garage or store in which to do it. We have the line of spark plugs which offers you the largest possibilities in sales and profits both for the present and the future. Let us, then, work together in 1923 for our mutual benefit.

## The Market for AC's Is Simply Enormous —and Is Growing Daily

Think of the *millions and millions* of AC factory-equipped cars already in use that require AC plugs!

About a million Chevrolets!

About a million Buicks!

About a million Dodge Brothers cars!

About a million Willys-Overlands!

Add to these the multitude of other cars: Cadillac, Chalmers, Chandler, Cleveland, Cole, Dort, Durant, Essex, Haynes, Hudson, Hupmobile, Jewett, Marmon, Maxwell, Mitchell, Nash, Oakland, Oldsmobile, Paige, R & V Knight, Star, and more than two hundred additional makes—all AC-equipped.

With the number growing by many thousands daily!

This gives you an idea of the tremendous ready-made market for AC's that is at your door, and will always be at your door in ever-increasing size.

In addition you have the enormous Ford replacement business, easily secured with the two-piece AC 1075's—

the best plugs ever made for Ford engines.

Remember, too, that AC's are heavily advertised—that every motorist either uses or knows AC's by reputation and wants them.

Also, the addition of AC Carbon Proofs in all sizes enables you to do a Winter spark plug business greater than ever before, as sets of these plugs are needed by all your customers to overcome engine troubles in cold weather.

Alongside of this, what other spark plug can offer you anywhere near such possibilities for large volume, quick sale, rapid turnover and liberal profit?

The foregoing facts simply mean that the AC is the only spark plug line upon which you can afford to concentrate, both now and in the future.

Let us repeat: You have the garage or store, we have the best spark plug line. Let us work together as our interests are the same.

AC Spark Plug Company, FLINT, Michigan U.S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending.

Plugs by the Set



## The Greatest Achievement

In New York, at the annual motor car show—and in five thousand other cities—Willys-Overland is announcing new 1923 motor car styles which eclipse in originality and refinement of design all its previous achievements.

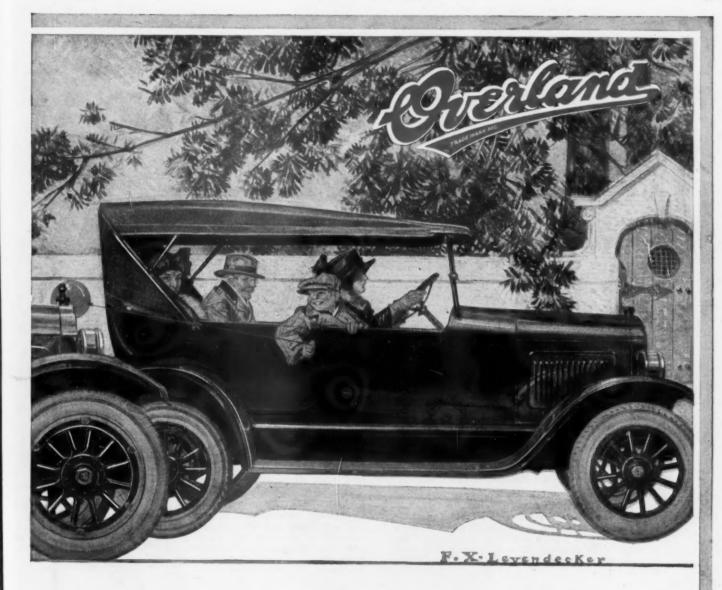
The new Willys-Knight Coupe-Sedan—an innovation—an entirely original body creation of steel, combines the chummy sociability of the Coupe with the convenience of the Sedan. A modish enclosed car for five. Its doors both front and rear avoid the inconvenience of folding seats and provide equal comfort for host and guests.

The new Willys-Knight Seven-Passenger Sedan and Touring Car are seven-passenger in fact as well as in name. Their ingenious design permits economy of weight which reflects in their very moderate cost of operation.

Four new Willys-Knight body styles on the "five-passenger" chassis introduce numerous improvements. In all these cars the motor improves with use.

Young ambitious men with small capital will find a great profit opportunity with Willys-Overland. Write!

> Willys-Overland, Inc. Toledo, Ohio Canadian Factory Willys-Overland, Ltd.



## of a Great Organization

The new low-priced Overland is wonderful value. The body of the Touring Car is entirely of steel. Its finish is hard baked enamel. Its tires are oversize. The hood is higher. Body lines are longer. Seats are lower. Triplex springs give you extraordinary comfort and add to the life of the car. A car that you ride in—not on!

The new Overland Sedan has few equals in riding comfort—none near its price.

In power and performance on all roads, the new Overland will give you cause for pride. Scores of records show it leads in low cost of gasoline and upkeep; styles—Five-Passenger Sedan and Touring, Roadster, Coupe. Drive an Overland and realize the difference.

The enthusiasm of those dealers who have seen this new line of cars and appraised the greater value of every car in the line, justifies the confidence that Willys-Overland dealers have an extraordinary opportunity for profit-making this year.

Write for interesting booklet describing in detail the many advantages of the Overland or Willys-Knight Cars,

> Willys-Overland, Inc. Toledo, Ohio Canadian Factory Willys-Overland, Ltd.



## Are You in a Position to Handle Cylinder Regrinding This Spring?

Due to the large increase of automobile owners during 1922 (over 1,250,000) and the results of the educational work, from about 1500 Heald regrinding shops now in the field there is no question but what the demand for reground cylinders will be far greater than ever.

If you are in any way connected with the maintainence of automobiles it will be very much to your advantage financially as well as in a business way, to look very carefully into the proposition of cylinder regrinding. Particularly is this true if you are centralized in a territory where there are a large number of registrations and no regrinding shops.

#### Recognized as an Absolute Necessity.

There is no question but what cylinder regrinding has become recognized as an absolute necessity when a car is overhauled and whether you are in a position to put in a machine for this personally or expect to send it out to someone who does, you should be thoroly sold on the proposition and in a position to talk intelligently and enthusiastically about it.

A shop that is prepared to handle this work is recognized by the automobile owner as up-to-date, can furnish service, and will complete a job which will give him thoro and lasting satisfaction.

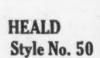
#### Must Be Ground on a Heald

The key to the whole situation, however, is the fact that automobile owners insist on Heald ground cylinders to bring them back to their original efficiency. This is due to the fact that they know all manufacturers use a Heald exclusively for this work.

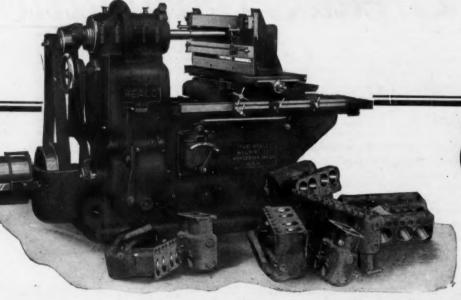
The machine is unusually simple to operate, has a capacity that will handle any bloc that may come into your shop, and will give you better finish with greater production than anything else on the market today.

The Heald service, both in regard to demonstration and sales and advertising suggestions, is invaluable to the one just starting in. Can't we send you literature or personally explain all the advantages of this business and the Heald machine?

#### The Heald Machine Company 61 New Bond St., Worcester, Mass.



shown at right, is the very latest Cylinder Grinder — massive, large capacity, simple, with an hydraulic drive for table, giving an unlimited range of speeds and furnished complete with jig, ready to go to work.



Grind with a

...



ON fourteen makes of motor cars, as impressive in character as in number, Tuarc Steel Wheels are standard factory equipment. Millions of passenger automobiles, throughout the world, travel on wood wheels made by Motor Wheel.

Motor Wheel production of truck wheels is the largest in the world. Pressed metal parts from the famous Gier Plant of Motor Wheel Corporation have been a potent influence in making motor cars and trucks lighter, stronger and more economical.

These are the material expressions of the bigness of Motor Wheel; but the whole of Motor Wheel Corporation, the real Motor Wheel, is revealed only in its *spirit*.

That spirit which was not content merely with the beautification of cars promised by early steel wheel development. So that in Tuarcs,

Motor Wheel ingenuity gave to steel wheels demountable rims, universal outside tire valves and standard hubs, together with unprecedented strength and resilience.

It is that same spirit which, brooking no half-way measures, has reached clear back to ownership of standing timber to insure the unvarying excellence of all the wood wheels made by Motor Wheel.

It is Motor Wheel persistence which has produced, again and again, metal stampings previously considered impossible of manufacture by the known stamping processes.

The whole automotive industry, and its whole market, the public, benefit constantly and tangibly by that Spirit which is Motor Wheel.

MOTOR WHEEL CORPORATION, LANSING, MICHIGAN

Motor Wheel PROBUCTS







Feminine interest in a motor car naturally centers on the body style—its comfort, convenience and fittings. The woman buyer will particularly appreciate a distinguishing mark on a motor car body, clearly indicating that in these essentials the car under consideration will amply fulfill her exacting desires.



Distinction, comfort, beauty and absence from disturbing noises have been attained to a very marked degree in motor car bodies built by Trippensee and bearing the Trippensee signature.

These characteristics inspire in the minds of both dealer and owner the same sense of pride in this most intimate of motor car units that they feel for the power plant of a really fine car.

The Trippensee signature gives positive assurance of correct design; sincere, careful workmanship; durable, noiseless construction, and careful personal inspection of each operation.

THE TRIPPENSEE MANUFACTURING CO., DETROIT



## ArrowHead

Quality at Quantity Prices

Arrow Head Products are made by expert engineers and mechanics in the largest factory in the world devoted exclusively to the manufacture of Pistons, Piston Pins, Axle and Drive Shafts.

All machinery and equipment is designed for specialization. Consulting engineers have pronounced the plant the best of its kind in the country.



The "Arrow Head" is Your Guarantee

## Products

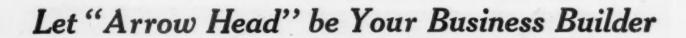
Worthy of Your Recommendation

You can set your "mikes" by Arrow Head measurements. Arrow Head products are tested by the most delicate instruments obtainable.

A complete line for automobiles, trucks and tractors. Carefully packed for protection in shipment. Attractively boxed for display in your stock.

ARROW HEAD STEEL PRODUCTS CO.

General Sales Offices, 616 S. Michigan Ave. Chicago, Ill.



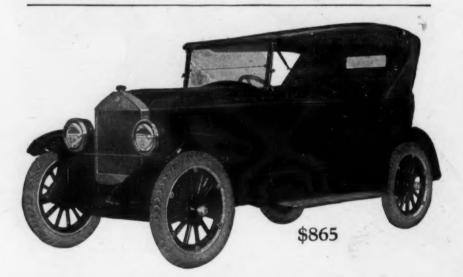
#### At the Automobile Shows

# DRI

Now, in addition to the substantial qualities for which the Dort Four has long been famed, there is a new and greater beauty in the body design, effected by an impressive change in radiator and hood. Consequently, the great value of the Dort Four is more pronounced than ever and its popularity, always outstanding, has increased tremendously. Eight models will be at the shows.

DORT MOTOR CAR COMPANY, FLINT, MICHIGAN

Dort Four Roadster . . . \$865
Dort Four Yale Coupe . . \$1020
Dort Four Sport Touring . . . 865
Dort Four Yale Sedan . . 1070
Dort Four Sport Touring . . . 995
Dort Four Harvard Coupe . . . 1240
Dort Four Sport Roadster . . . . 995
Dort Four Harvard Sedan . . 1370



(1498)

### At the Automobile Shows

# DRI

The Dort Six introduced November 1st and welcomed by the public with an enthusiasm seldom accorded any motor car has now, by its superb performance under every conceivable condition, justified and strengthened the conviction that it would establish an entirely new standard of value. The Dort Six motor with its wonderfully developed lubrication system—years ahead of ordinary design—that has created such wide interest among engineers and car owners alike, will be on display at the shows. See it!

DORT MOTOR CAR COMPANY, FLINT, MICHIGAN



(1499)



is going to be the biggest year in the history of the automobile. *Now* is the time to look over your kit and see what tools you will need to handle every repair job *right*. The Starrett Catalog No. 22RB will help you—it lists and describes over 2100 fine precision tools for mechanics and machinists.

This valuable book will be sent absolutely free.

Write for it today and the Supplement describing the new Starrett Tools

THE L. S. STARRETT CO.

The World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled
ATHOL, MASS.







### we have discovered a solution

-to the problem of bad weather driving.

The danger of accident due to wet, fogged or snowed-up windshields is past. And the necessity for removing the hands from the steering wheel is eliminated. As essential to YOUR safety as the warning signal or the bumper. The Motorist has demanded this indispensible appliance for years and it is now available.

### The Berkshire Electric Windshield Wiper

is practical, efficient, economical and noiseless. Weighs less than two pounds and requires no more space than the average mirror. Operates from the storage battery and uses a minimum of current. Entirely automatic with a uniform speed regardless of the speed of car or motor. Driven by a sturdy electric motor—can be operated by hand if desired. Has been in service on all makes of cars upwards of two years, with records of 2000 hours' continuous operation without repairs or adjustment.

A desirable and necessary fitment for every car regardless of size or type

Furnished with or without Mirror. Price Wiper complete with wiring, but without Mirror, \$8.50 Wiper complete with wiring and with bevelod place Mirror, \$12.00

Guaranteed to FIT, to SERVE and to SATISFY

Berkshire Products Corporation Pittsfield, Massachusetts
Successors to J. & B. MANUFACTURING CO.

BERNCHIRE

## The National Auto

Under Auspices of National Automobile Chamber of Commerce, Inc.

AT NEW YORK Grand Central Palace January 6th to 13th

AT CHICAGO Coliseum and Armory January 27th to February 3rd

S. A. Miles, Manager 366 Madison Ave., N. Y.

An amalgamation with assets of millions of dollars announces the new National line -including a light-six

\$795

AT THE National Automobile Shows there will be revealed the details of a six-cylinder car—the dashing younger brother of an aristocratic line of Sixes—with 112-inch wheelbase that should startle any preconceived ideas of what is possible at a price that lessens sales resistance to a negligible quantity.

You are invited to look into the value that is possible with a production schedule of 30,000 cars for 1923. Any motor car dealer may well ask himself whether he would rather compete with such a line—or sell it.

NEW YORK: Exhibits at Grand Central Palace, Waldorf-Astoria Hotel and Hotel Commodore; Headquarters at Waldorf-Astoria.

CHICAGO: Exhibits at The Armory and Congress Hotel; Headquarters at Congress Hotel.

#### NATIONAL MOTORS CORPORATION

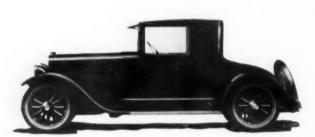
Chicago St. Louis Boston Indianapolis Louisville

Lockport, N. Y. Jackson, Mich. Saginaw, Mich.

NATIONAL SIXES

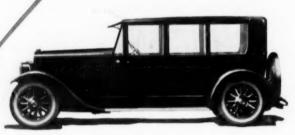


The NATIONAL SIX-FIFTY-ONE \$1485



Six Fifty one Coupe

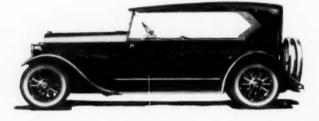
 $\begin{array}{c} \text{BODIES} \\ \text{\tiny BY} \end{array}$  H. F. HOLBROOK



Six Fifty one Sedan



Six Seventy one Sedan



Six Seventy one Phaeton

Complete details and full specifications of National Sixes will be given at the Automobile Show.

NATIONAL SIXES



The NATIONAL SIX-SEVENTY-ONE

### Complete Line fine (ars

Under one family name is presented at the National Automobile Shows for the first time a full line of fine six-cylinder cars that completely covers price ranges and is replete with body styles which answer every motor car need or desire. They represent the rich experience of a group of engineers brought together by the National Motors Corporation and co-ordinate the ability that developed and perfected the six-cylinder engine from the day it was first built for the Naional Car. Into each chassis assembly has gone the combined experience of every type of car on every variety of American road condition. Mechanically perfect and backed by broad facilities for manufacture and service, these cars meet the need for a full line of fine cars that reflect quality through-

Custom designing is apparent in every model as the result of the contribution of one of America's foremost designers. Bodies are by H. F. Holbrook and his personal supervision is expressed in every car, from the building of the bodies and the hand tailoring of the tops to the selection and fitting of the upholstery. Coach work is of the most substantial and durable sort and riding comfort as well as performance are inherent qualities that have long been accorded to National Cars. Under one family name is this line of cars, ranging from \$795 for the Six Thirty one Phaeton and \$1485 for the Six Fifty one, to \$2485 for the 7-passenger Six Seventy one.

National Cars are made and serviced by the National Motors Corporation, a consolidation with assets of over twenty millions of dollars and plants in eight states. The National Six unites twenty years of reputation in the fine car class with a manufacturing and service organization that is one of the most important advances ever made in the automobile industry.

### MOTORS CORPORATION t. Louis Boston Indianapolis Louisville Lockport, N. Y. Jackson, Mich. Saginaw, Mich. NATIONAL MOTORS

Chicago

St. Louis



Six Seventy one Close-coupled Sedan

NEW YORK: Exhibits at Grand Central Palace, Waldorf-Astoria Hotel and Hotel Commodore; Headquarters at Waldorf-Astoria.

CHICAGO: Exhibits at The Armory and Congress Hotel; Headquarters at Congress Hotel.

## 

tor



ENTERING the field at a time when there is universal demand for a light-six that can show performance and stability at a price which puts it beyond competition even of the four.

It offers an unexpectedly favorable opportunity for 1923. Those dealers attending the National Shows at New York and Chicago will have the first chance.

NEW YORK: Exhibits at Grand Central Palace, Waldorf-Astoria Hotel and Hotel Commodore; Headquarters at Waldorf-Astoria.

CHICAGO: Exhibits at The Armory and Congress Hotel; Headquarters at Congress Hotel.

#### NATIONAL MOTORS CORPORATION

Chicago St. Louis Boston Indianapolis Louisville Lockport, N. Y. Jackson, Mich. Saginaw, Mich.

### NATIONAL

#### SIX FIFTY ONE

Continental Red Seal six-cylinder unit power plant; 121-in. wheelbase; Timken bearings in all four wheels; 32x4 cord tires; body by H. F. Holbrook with complete equipment.

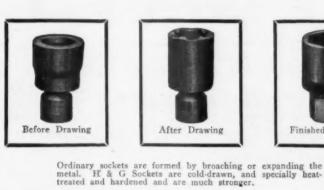
#### SIX SEVENTY ONE

National six-cylinder, 71-hp. highefficiency unit power plant; 130-inch wheelbase; full floating rear asle; 32x4½ cord tires; body by H. F. Holbrook with complete equipment.

\$795

#### SIX THIRTY ONE

Six-cylinder, unit power plant: 112-inch wheelbase; full semi-elliptic springs; standard selective-type transmission with disc clutch: 31x4 cord tires; body by H. F. Holbrook with complete equipment.











H & G Speed Wrench Fits all the Sockets' and Attachments

### 122 Combinations

THE one hundred and twenty-two different combinations possible with this new H & G socket wrench enable you to reach every nut on every car as though each one were before your eyes.

And, you have the satisfaction that with this wrench you can USE YOUR STRENGTH without breaking the sockets or snapping the attachments.

#### Meets Strength with Strength

The H & G Wrench Set was designed primarily for practicability-to stand hard usage from the repair-

For instance, the sockets are cold-drawn from special steel, heat-treated and hardened by a special process, imparting great toughness and durability. The socket walls are made comparatively thin, permitting the socket to set in the tightest place.

The sensible design of the Adjustable T Handle, Reversible Ratchet, and other wrench parts, is appreciated by a mechanic.

#### A Real Mechanic's Outfit

The high standing of H &-G die heads in the industrial world-especially with automobile manufacturers -would not allow us to put out a wrench set of only ordinary quality. It must be a REAL TOOL, one that a fine mechanic will praise.

Mindful of this responsibility, we offer H & G Socket Wrench Sets without apology, confident that they will enhance our reputation.

#### A Good Profit and Quick Turnover

Our unusual facilities enable us to manufacture and market the H & G Wrench Sets at a remarkably low price. We have no million dollar advertising campaign to show you, no high-sounding claims of the market possibilities, but we do know that the jobber and dealer who elects to sell H & G products will make no mistake. Write for details, discounts, prices and literature.

The Eastern Machine Screw Corporation 10-20 BARCLAY STREET, NEW HAVEN, CONN.



maintain a more even wall presssure!



The expansion of the Master Lock Joint maintains the even pressure

You can't deliver piston ring satisfaction to your customers unless you give them a ring that

will always maintain a uniformly even wall pressure. Yes—and even after thousands of miles of travel.

Everyday Piston Rings are exclusive in that they do maintain a more even wall pressure than is possible with other rings. It's due to each ring being individually cast, and so manufactured that it has perfect tension and will maintain even wall pressure under all compressions and temperatures.

Everydays keep a tight, non-leakable contact with the walls. You just can't force gas—oil—power past them! They save gasoline and oil—increase power and last longer.

We haven't space to tell about the other exclusive advantages of *Everyday Piston Rings*. But—we do want to tell you that when you sell *Everydays* you make MORE profit. And with all their advantages as selling points you can sell MORE rings!

All standard sizes from 2 inches up. Oversizes .010, .020, .030. List prices: up to 4 inches incl., .50;  $4_{10}^{1}$  to  $4_{10}^{1}$  inches incl., .60;  $4_{10}^{5}$  to 5 inches incl., .70. Sold through jobbers everywhere. Resold by leading dealers.

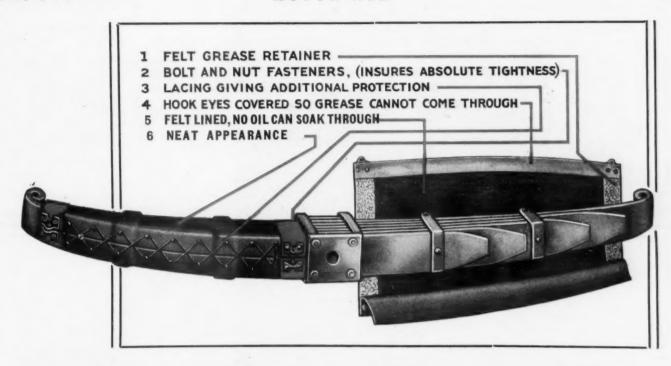
Write NOW for Everyday's Xtra Profit Sales Plan

> Patent No. 1,132,762 March 23, 1915



### EVERYDAY PISTON RING CO. INC.

See us at the New York and Chicago Automobile Shows



### A Ten Minute Installation

### —and spring squeaks are banished forever

For, once installed, RED TIP Covers, by their constant, automatic feeding action, keep the spring leaves freshly lubricated, PERMANENTLY—always easy working—preserving the riding qualities that influenced the sale of the car when it was bought.

Whether you use grease or oil, RED TIP is just as effective. Each leaf slides over the next on a wear-resisting film of lubricant.

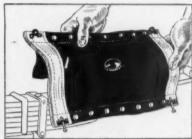
No Squeaks or Rattles. No Rust or Vibration. No Broken Springs. Dust, dirt and water cannot leak in. Grease or oil cannot leak out.

RED TIP Covers are quickly attached. Not a bolt or nut is dis-

turbed. And once installed, your springs need no attention for a year or two. When they do, it is merely necessary to remove cap in the center of Cover and shoot a fresh supply of grease or oil from any type grease gun or with ordinary oil can.

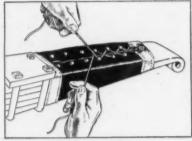
Our descriptive data gives the interesting details of the fast-selling necessity. Sent on request.

SNAPPEE COMPANY 7-11 Broadway, Chelsea, Mass.

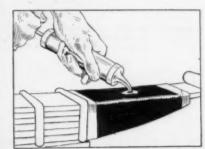


WRAP IT AROUND

DEALERS: It will be well worth your while to investigate our attractive trade offer. Our unusually liberal discount will prove interesting. Details sent on request.



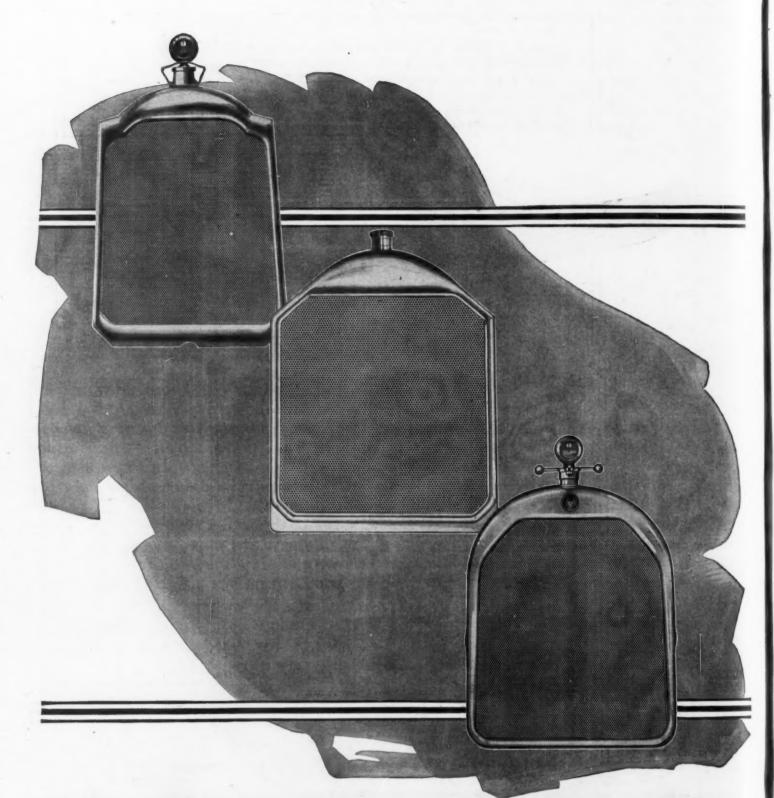
LACE IT UP



FORCE IN GREASE OR OIL

Lubricating Spring

ring Covers



## FEDDERS

### Predominating Character

- steadily maintained

Character we are told, is the child of daily habit. Yesterday is the father of today

What we were 20 years ago is only interesting as it affects our position at the present time.

Packard, Pierce-Arrow, Peerless - and Fedders. Together in 1900--together today. Evidently the character, the "quality habits" of these manufacturers have been steadily maintained throughout the years.

Old habits, old friends, seasoned character, are stronger, more dependable than those newly formed.

A"Quality Habit" maintained for 20 years is hard to break. It is practically a synonym for absolute dependability.

FEDDERS MANUFACTURING COMPANY INC. BUFFALO, N.Y.

RADIATORS



### Greater Earning Power for Your Garage

The capable motor mechanics in your employ turn out work in their line that sends the car owner away satisfied and you know that when he is again in need of such service he will return to your garage for it. But your greatest difficulty has been to employ men who could do the same kind of a job in servicing electrical equipment.

#### Learn to Service Electrical Equipment the Westinghouse Way

Westinghouse offers the garage man an opportunity to learn how to service automotive electrical equipment. The Westinghouse Service Encyclopedia

and Parts Data is not an engineering text book. It is written for the garage mechanic and is filled with Service information that he has use for, in the garage every day.

#### Greater Service—More Profits

With a Service Encyclopedia and Parts Data in your Garage your men can intelligently supplement the service of the 290 Westinghouse Field Representatives, at least one of which is located conveniently near you. And your co-operation with a Westinghouse Field Service Station will mean better service for your customers and greater profits for your garage.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY Automotive Equipment Department

Sales and Service Headquarters: 82 Worthington St., Springfield, Mass.



Here are some of the things covered in the Service Encyclopedia, Volume I, and Parts Data, Volume II.

#### Service Encyclopedia, Vol. I

Elementary Electricity Electric Machines Voltage Regulators Current Regulators Cutout Switch Vibrating Regulator Ignition (all types) Storage Batteries Generators Starting Motors

Internal Diagrams (of all types of apparatus produced by Westinghouse).

Car Wiring Diagrams (of every car or truck Westinghouse equipped). Service Section. 1. Location of trouble. 2. Easy methods of repair of all Westinghouse equipment. Test Equipment

#### Parts Data, Vol. II

Complete lists of cars Westinghouse Equipped.

Style number and price of Westinghouse units and parts on these cars.

Service Representatives (from whom you can purchase genuine Westinghouse Parts).

#### An Investment in Service

The Westinghouse Service Encyclopedia and Parts Data is published in two handsomely bound volumes of from 700 to 800 pages each. It will be supplied to you at a price that just covers the cost of publishing. Fill out the coupon below and send it to us with your check or money order for \$24.00 and we will send you, postage paid, insured, Volumes I and II of the Service Encyclopedia. You may purchase one Volume at a time at the cost of \$12.50 each, If you so desire, supplementary sheets of information will be mailed you quarterly at an additional cost of \$2.50 a year after January 1st, 1923. All supplements issued before that date will be mailed you free.

Don't let opportunity slip away from

Don't let opportunity slip away from you. Mail the coupon today!

A list of Westinghouse Service Represent-atives, from whom you can obtain Genuine Parts, will be supplied at your request.

### Westinghouse

STARTING, LIGHTING & IGNITION SERVICE Enclosed find \$...... In return please send me Volume I and Volume II, Westinghouse Service Encyclopedia and Parts Data. (If you desire both volumes send \$24.00 with the coupon. If you desire Volume I, the Service Manual, send only \$12.50 and cross out the words "and Volume II".)

Please send me more information about the Westinghouse Service Encyclopedia and Parts Data.

Name . Street

City .M.A. 1-4 "What New Car Is That?"



"It's the new Six that Jim Handley just brought out and is showing for the first time at the New York Show."

"A distinctive looking job and the price is just right to get a lot of business."

"Jim has the kind of a contract we were talking about last month and he asked me specially to tell you to look him up on the second floor of the Grand Central Palace.

"I've just signed up for my territory and I know his proposition is just what you are looking for."





## ELCAR

A WELL BUILT CAR



### FOURS and SIXES The Complete Profit Line for Dealers



### **DEALERS**

Here is the price range that insures

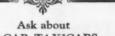
**PROFITS** 

**FOURS** 

\$965.00 to \$1425.00

SIXES

\$1395.00 to \$1995.00 [f. o. b. factory]



Ask about
ELCAR TAXICABS
unusual proposition—quick turnover

New Elcar—new opportunity. Now is the time to "get set" on a real profit basis, selling the right car at the right price. Eliminate the annual question, "What car will I sell this year?" Alert dealers act—SIGN UP—while others hesitate.

The new Elcar line of Fours and Sixes has been developed along highest engineering standards. There is a market for Fours and Sixes which, though reasonably priced, are quality built by quality builders.

The new Elcar line gives the dealers' salesmen bigger leeway—wider field of prospects—more speed in closing sales.

ELCAR SIX is equipped with 8-R Continental Red Seal Motor and other units of equal worth.

ELCAR FOUR has improved Lycoming-Elcar motor. Elcar bodies are all Elcar-built insuring style and satisfaction.

Write TODAY for money-making facts.

ELCAR MOTOR COMPANY, Elkhart, Indiana Builders of Fine Vehicles Since 1873



*listen in* on any group of people talking "automobile" today and you're very likely to hear a discussion of "STABILATION"

### Watson STABILATORS

JOHN WARREN WATSON COMPANY, PHILADELPHIA

CHANGE THE WHOLE NATURE OF YOUR CAR



to snubbing

o snubbing

In checking spring recoil, Stabilators work exactly opposite to the snubbing principle. Instead of checking with a jerk at the tail end of the recoil movement, Stabilators get on the job at the very beginning of the movement and smoothly ease you back to normal. Results produced by the one method give no conception of those produced by the other. They are different to the point of absolute oppositeness.

t is a recognized fact that the average car can now perform 'way beyond the limit where it is comfortable and safe to drive STABILATORS give this needed ROADABILITY

## Watson

CHANGE THE WHOLE NATURE OF YOUR CAR

JOHN WARREN WATSON COMPANY, PHILADELPHIA





In this fine, new plant in Detroit, Mogul production facilities have again been doubled, this being the third time within recent years. Every possible facility for economical, accurate production of bearings on a large production scale has been provided in this new plant.

Our representatives will be located at Commodore Hotel, New York, Congress Hotel, Chicago, during the automobile shows.

### The Plant "Mirrors" the Product

Birdseye views have largely gone out of fashion in advertising, due, perhaps, to the exaggerations employed by old-time advertisers.

But it is a fact that, in an accurate picture of a plant, one can usually see clearly imaged the quality and value of a product.

For the plant of any sound business can only grow and improve in proportion to the public's liking and demand for the article it makes.

So we show this view of our new, superbly equipped plant with justifiable pride in the fact that it offers the clearest indication of the high standards of quality which have been maintained in Mogul bearings over a long period of years, and the public's preference for this sort of bearing quality.

The growth of the Muzzy-Lyon Company, from a small room, 25 years ago, to this great plant, offers tangible evidence, either to the user of bearings or the manufacturer who buys bearings, that Mogul stands for the very highest quality in bearings, and a reliable, capable source of supply.

MUZZY - LYON COMPANY
DETROIT MICHIGAN

THOCHE Engine Bearings and Bearing Alloys

### Growing Profits in

# The state of the s

There will be a growing use of OFF'N'ON Chains for these two reasons:

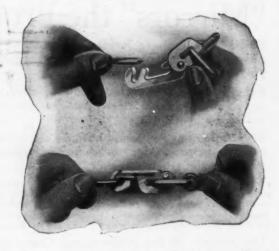
#### The Positive Lock

This patented lever lock makes it easy to put them on and to take them off. It takes up slack; thus saves wear on tires and chains alike. No more lost chains—no more loose chains.

### The Slip-On Link

This patented slip-on link makes it easy to take off the old cross chain and put on a new one.

A child can do it. Yet they cost no more.





The growing use of these chains means that profits to dealers will multiply.

Get in on this profit maker now. Order today from your jobber. Buy spare cross chains because you can sell a set of extra cross links with every chain.

Write us for circular and price list, giving the name of your jobber

### PYRENE MANUFACTURING COMPANY

Makers of Pyrene Fire Extinguishers

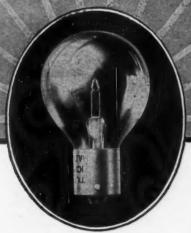
520 Belmont Ave., Newark, N. J.

Branches: CHICAGO-17 So. Jefferson Street

ATLANTA-24 Nassau Street

KANSAS CITY—1712 Grand Avenue SAN FRANCISCO—977 Mission Street

## TUNG-SOL



QUALITY is the outstanding characteristic of TUNG-SOL lamps for automotive service. This feature has developed a nation-wide demand. We could build a cheaper lamp, but then it would not be TUNG-SOL. We could build more lamps, but then we might endanger that high standard which has become so much a part of the TUNG-SOL reputation. It is our belief that Quality in lamps is supremely important because safety so often depends upon them. There is an obligation to the motorist which is faithfully fulfilled when TUNG-SOL lights the way.

MINIATURE INCANDESCENT LAMP CORPORATION, Inc.
Newark New Jersey

Licensed Under General Electric Company's Incandescent Lamp Patents



LET TUNGSOL LIGHT THE WAY





As far as the power plant is concerned the maker of a medium price car or truck has given you all the value he can when he uses one of the NEW Lycoming Motors



(200,000 PRESENT USERS WILL TELL YOU SO)

THE great group of owners who have bought nearly two hundred thousand automotive vehicles with LYCOMING MOTORS have grown to accept the LYCOMING name plate as a safe criterion of the high ideals and quality standards of the maker of the completed car

That is why these thousands of present LYCOMING owners take such a marked interest in the make of motor used when they are buying a second, third or fourth time.

When they have once tasted the extraordinary LYCOMING performance and become accustomed to its unexpectedly low operating and maintenance costs, they are spoiled for any ordinary motor and will return again and again to the car or truck that continues to use

And now these same owners have something to make them more eager than ever to find a LYCOMING in their next car or truck. For the most remarkable motors that have yet borne this famous name plate are now available in four models.

Ideals of performance with low operating and maintenance costs have been attained that are without precedent in the tremendous four cylinder field.

For instance, the new LYCOMING design includes a five bearing crankshaft. This rigid mounting results in vibrationless performance beyond the possibilities of the ordinary two and three bearing practice, and combines the flexible operation heretofore associated with multicylinder motors with the economy of the four,

Whether you are interested in a passenger car or truck, ask for a demonstration from the local distributor of any of the makes that use one of these amazing new LYCOMING models.

The interest this latest motor development has created has moved us to have printed a valuable book on the whole subject, for car and

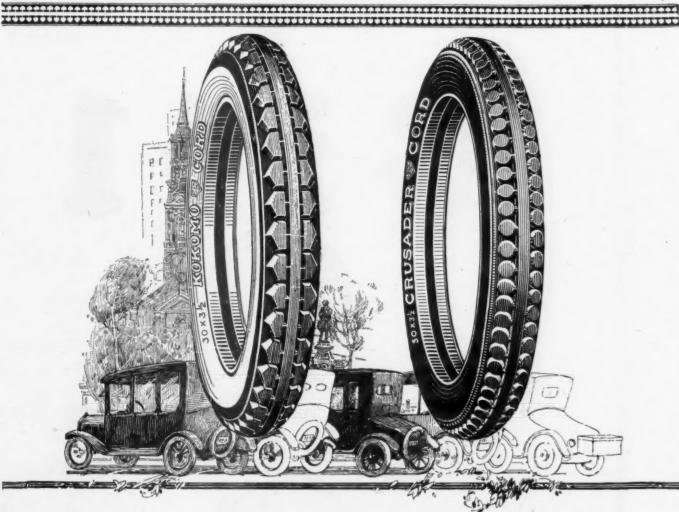
A copy of this book will be sent to any responsible person upon request. We are especially anxious to place one in the hands of each of the nearly 200,000 owners who are now driving behind LYCOMING motors so that they can see the still greater LYCOMING they can get the next time they buy.

Full name and address should be given.

LYCOMING MOTORS CORPORATION, WILLIAMSPORT, PA.



This is a reprint of our Saturday Evening Post Advertisement for January 6th, 1923, reaching more than 2 million families

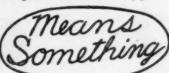


### Get Your Share of 30x3 Cord Business!

THE SMALL CAR OWNER has been riding on 30 x 3½ Kokomo cords now for several years. He knows their honest construction and their staunch durability; he knows through experience that they will give him mileage plus, that when he insists upon Kokomos (and he does insist) his tire troubles are at an end.

KOKOMO DEALERS EVERYWHERE find that they are getting the big end of the 30 x 3½ cord business. Small car drivers want Kokomo cords, and fleet owners of trucks and light business cars are more and more turning to Kokomo

cords as regular equipment. Kokomo 30 x  $3\frac{1}{2}$  cords—the oversize Heavy Duty and the full size Crusader—are made right, priced right, and are right. 1923 will see cord casings holding the upper hand in the  $3\frac{1}{2}$  inch tire market. Kokomo dealers are in on the ground floor



KOKOMO RUBBER CO., KOKOMO, INDIANA



Gill





Servus

## A Famous Line of Piston Rings—Complete

Gill Interlocking-Joint piston rings have long dominated the patented piston ring field, because of their unequalled ability to renew engine power and keep it at its peak.

Special Oil-Wiper and Servus Step-Cut rings now offer these same vital qualities, in the step-cut and oil-wiping types.

All three rings are individually cast of the same tough grey iron composition that knows no fatigue and holds its elasticity to the very end. All three are lathe turned for highest accuracy and quick seating properties.

Such rings hold compression better and wear longer. And they sell better. All sizes and oversizes are quickly available from large stocks maintained by jobbers, backed by 36 factory branches.

Gill, 75c—Special, 40c—Servus, 30c

### Gill Manufacturing Company

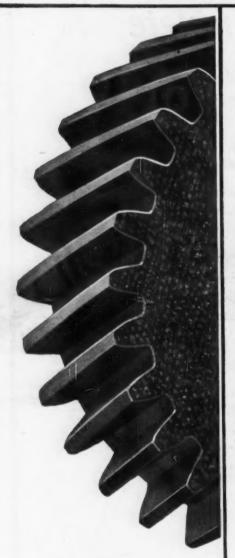
8300 South Chicago Avenue, Chicago

Eastern Headquarters—10 Central Park, West—New York City Canadian Factory—415 King St. W. (Brown Engineering Co.), Toronto Sole Canadian Distributor—Canadian General Electric Company, Limited Export—American Steel Export Co., Woolworth Building, New York City





## CELORO SILENT TIMING GEARS



Installation showing Celoron camshaft gear

CELORON GEARS are silent. They never develop grinds, rasps, or rattles.

CELORON GEARS insure positive timing.

CELORON GEARS are water-, grease-, and oil-proof. They have the resiliency to withstand shocks and strains—and endure long, hard wear.

CELORON GEARS are standard equipment on many of America's bestknown cars.

Visit our exhibits at the New York and Chicago Automobile Shows

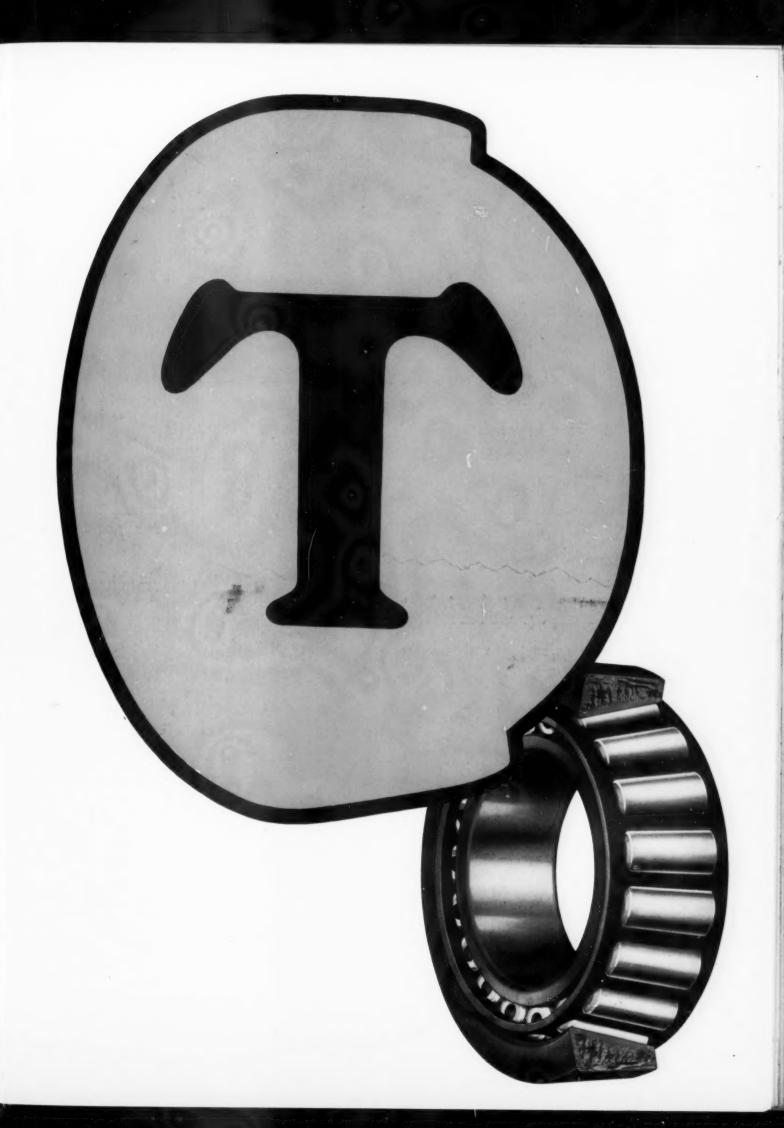
Diamond State Fibre Company Bridgeport (Near Philadelphia), Pa.

Branch Factory and Warehouse, Chicago Offices in Principal Cities In Canada: Diamond State Fibre Company of Canada, Limited, Toronto





Installation showing Celoron crankshaft and generator shaft gears.



### Timken Roller

UPON dependable, available, economical service has the automotive industry builded so swiftly and so strongly.

Motor cars and motor trucks are built as well as the best engineering brains of the world can build them. The best raw materials and the best component parts go into the best designs that can be evolved. And yet the most perfect mechanical device will not run without service; any more than one's body will function properly without attention—without service.

When you need a Timken Bearing you get it easily and quickly. That is service. That is service that protects the users of Timken Bearings, safeguarding the automotive industry (and the specific manufacturer in the industry whose product you use).

The Timken Roller Bearing Company now makes available to you the most specialized bearing service in the industry.

For six and a half years the economical distribution of Timken Bearings to owners, dealers, and garages has been made through a separate company organized for that purpose. Effective January 1, 1923, this organization, consisting of thirty-two main,

### TIMKEN Tapered ROLLER BEARINGS

## Bearing Service

direct branches, and approximately one thousand authorized distributors, will be under the direct operation of a new company, THE TIMKEN ROLLER BEARING SERVICE & SALES COMPANY, with headquarters at Canton, Ohio.

This far-reaching service, safeguarding the interests of motorists everywhere, makes Timken Bearings available within a few minutes, in every size, throughout the United States and Canada.

The Timken Roller Bearing Service & Sales Company will function as a guarantor to the Automotive Industry, that the 70,000,000 Timken Bearings in use in more than 400 makes of automobiles, trucks, and tractors, will be most adequately served.

The ever-increasing use of Timken Bearings in the industrial field; in machine tools; in industrial trucks, tractors, and trailers; in conveying machinery; in mine cars; in ventilating machinery; in a word, "wherever there is friction," makes this nation-wide service and sales organization a distinct contribution to American industry.

The Timken Roller Bearing Co

## TIMKEN TOPERS ROLLER BEARINGS



### THE TIMKEN ROLLER BEARING SERVICE & SALES COMPANY

CANTON, OHIO

 B	R	A	N	C	H	E	S	

CITIES	ADDRESSES	BELL TELEPHONE
Atlanta, Ga.	501 Peachtree St.	Ivy 1483
Baltimore, Md.	1041 Cathedral St.	Mt. Vernon 5400
Birmingham, Ala.	613 S. Twentieth St.	Main 3020
Boston, Mass.	1107 Commonwealth Ave.	Brighton 3750
Brooklyn, N. Y.	1408 Bedford Ave.	Lafavette 2072
Buffalo, N. Y.	1372 Main St.	Tupper 0869
Chicago, Ill.	2021 S. Michigan Ave.	Calumet 2960
Cleveland, Ohio	7026 Euclid Ave.	Randolph 3129
Dallas, Texas	2005 Main St.	Y-2252 & Y-2220
Denver, Colo.	1257 Broadway	Champa 2837
Detroit, Mich.	4159 Cass Ave.	Cadillac 5250
Fresno, Calif.	2120 Tuolumne St.	Fresno 4602
Indianapolis, Ind.	521 N. Meridian St.	Main 5122
Kansas City, Mo.	2435 McGee St.	Grand 0829
Los Angeles, Calif.	1156 South Grand Ave.	Broadway 8053
Milwaukee, Wis.	145 Oneida St.	Broadway 3979
Minneapolis, Minn.	1115 Hennepin Ave.	Atlantic 8250
Newark, N. J.	458 Broad St.	Humboldt 1090
New Orleans, La.	755 St. Charles St.	Main 4059
New York, N. Y.	230 W. 56th St.	Circle 7711
Olkahoma City, Okla	1116 N. Broadway	Maple 0475
Omaha, Nebr.	1812 Harney St.	Atlantic 2844
Philadelphia, Pa.	1208 N. Broad St.	Poplar 3460
Pittsburgh, Pa.	117 S. Highland Ave.	Hiland 1606
Portland, Ore.	24 N. Broadway	Broadway 1799
Richmond, Va.	1309 W. Broad St.	Boulevard 5101
Salt Lake City, Utah	64 W. Fourth South St.	Wasatch 9791
San Francisco, Calif.	1800 Van Ness Ave.	Franklin 410
Seattle, Wash.	321 East Pine St.	Elliott 67
St. Louis, Mo.	3300 Locust St.	Bomont 338
Toronto, Ont.	489 Yonge St.	North 6649
Winnipeg, Man.	327 St. Mary's Ave.	Gov't. Tele. A-3592

Approximately 1000 Distributors

There's One Near You





### A poor test set creates distrust— The Allen-Bradley Set inspires confidence!

WHY? Because an ordinary battery tester gives very little information about the battery and your customer is left entirely in the dark. He questions your judgment and is skeptical about your suggestions.

On the other hand every indication of the Allen-Bradley test set is explained on the Allen-Bradley test chart and the proper remedy is indicated. Install the Allen-Bradley chart, today, and let your customer see for himself why his battery needs repairing or why he should buy a new one. Your up-to-date methods will inspire confidence and increase your profits. Try it!

The Allen-Bradley Set is a compact, rugged, and foolproof battery tester which will stand tremendous abuse in service station work. It is portable and almost indestructible. It is equipped with voltmeter, ammeter, and necessary test clips.

REMEMBER - The well equipped shop gets the business.



Men-Bradley Ca. Electric Controlling Apparatus 281 Greenfield Ave. Milwaukee, Wis.

The Allen-Bradley Chart is a large wall chart in color, which indicates a remedy for every battery trouble. Special tables for battery work are part of the Chart. Avoid slip-shod methods and use the Allen-Bradley Battery Test Chart, today!

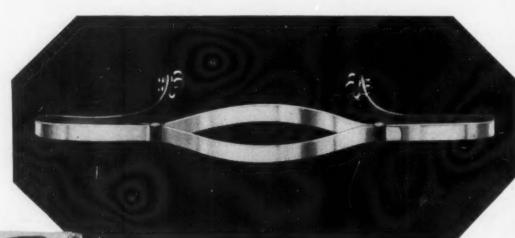


GH-RATE DISCHARGE TEST

When you go to the "shows" be sure to see the Lyon Bumper Exhibit.

> New York Space D-194

Chicago Spaces 66-67





Advantages

That Help Sell

**Lyon Spring Bumpers** 

1 Open "looped-ends" absorb blow in place of passing it on to frame.

The extraordinary resiliency that is due to the combination of the Lyon-patented construction and the high quality spring steel.

3 Ease of attachment. Lyon-patented device makes drilling and altering unnecessary.

## Meet the "Vanguard" —a new member of the LYON family

BEAUTY. Graceful and distinctive in design and finish. Here is the only moderate priced bumper that combines real "class" with positive Lyon protection.

PROTECTION. Extra-broad bumping surface with the Lyon-patented two-piece construction, two-inch spring steel, and open looped-ends give the Vanguard the super resiliency that makes all Lyon Spring Bumpers such effective protection.

PRICE. It is only because we have a daily capacity of 5,000 Lyon Spring Bumpers that we can offer the broad-faced Vanguard at \$16.50. In good looks, in staunchness of construction, in out-and-out value, no other bumper approaches the Vanguard at this low price—or near it.

Japan and Nickel Finish, retail price, \$16.50 Other Lyon Spring Bumpers retail from \$10 to \$25

DEALERS. Add the Vanguard to your Lyon line. They'll sell like hot-cakes. Write your jobber for prices. JOBBERS. Place your orders now for immediate deliveries on the Vanguard. Write us for the Lyon proposition.

METAL STAMPING CO., Long Island City, N. Y.

LYON RESILIENT BUMPERS

### までしていいりを見りまれる見上さ

### Must a tire business be small?

RALEIGH, North Carolina is not a large city. It has a population of 24,418. The county itself has 5,377 cars registered. Nevertheless the distributor of Hanes Cords in that territory sold exactly \$19,321.90 worth of these high quality tires in the first five months he handled them, ending with November 30th, 1922. In other words this Hanes distributor made an average sale of \$3.59 to every car owner not alone in the city but the county itself. This is no unusual Hanes record. It can be duplicated in your own town.

Stop for a moment, consider the number of cars in your own town or city and multiply by \$3.59 and you will see for yourself just what business is possible for you to do in let us say six months instead of the five

in which this particular Hanes distributor did the job.

Just to be sure that you do such a business the Hanes Rubber Company will run in your local newspaper a 7,800 line campaign, the first ad to start the day your initial shipment of Hanes Cords arrives. Such an exceptionally strong local newspaper campaign will help you greatly. There are also available other means of assistance which the Hanes representative will be glad to point out to you.

If yours is a town or county with say 3,000 cars registered stop now and consider whether or not you would like to do \$10,770.00 worth of tire business in the next six months. If you do, we shall be glad to send a Hanes representative to confer with you.

HANES RUBBER COMPANY

Winston-Salem, North Carolina

### HANES CORD TIRES

The High Water Mark in Tire~making Skill





### Transforms Any Ford!

Every owner wants it installed -on sight

Replacing the 2 plain washers in the Ford rear axle with Bantam Thrust Ball Bearings F-40 makes all the difference in the world. Ten, fifteen, twenty thousand miles without trouble, users report. Besides this, F-40 cuts down friction and gets more power to the rear wheels. Fords climb better, coast faster and farther, use less gasoline.

A "Clemons Special" (Ford) equipped with Bantam F-40 by Mr. F. E. Clemons of Indianapolis, recently did a track mile at Kalamazoo in 48 seconds flat.

All Ford Cars used to come with thrust ball bearings in the rear axle. Now they have only plain washers. When these washers

wear, the differential shifts away from the driving pinion - until one or both let go.

Bantam F-40 is strictly high class. Heattreated collars, ground raceways, 40 highest grade steel balls, solid bronze retainer.

No wonder they sell on sight. Show F-40 and you get the "go ahead" to install it. A real winter overhauling opportunity.

Your distributor carries F-40 in stock. If he cannot supply you, write direct to one of the addresses below.

BANTAM BALL BEARING CO.,

Pioneer Manufacturers

BANTAM, CONN.

Bantam Replacement Bearings are made in sizes to fit all makes of cars, trucks and tractors. Latest Price List sent direct of us.

Detroit Office, 905 Dime Bank Bldg.



Frank M. Cobbledick Co., 103 Polk St., San Francisco Mr. F. M. Boyd, The Avon, 6 East Read St., Baltimore, Md.



\$1485-and a Kissel

In every respect this new Custom-Built Six is a worthy successor to other cars that have worn the Kissel nameplate.

High standards of hand craftsmanship that have long been the boast of this organization are everywhere maintained.

A new and improved custom-built motor, of more than ordinary power and flexibility, lifts this car from 5 to 60 miles per hour in 30 seconds with no vibration point between these speeds.

Weight has been materially reduced throughout; yet strength has been added. Distinctive body lines have been made even more beautiful. The same exclusive engineering developments that have long characterized Kissel construction are retained in the new models.

All the resources of the Kissel Motor Car Company and all the skill of seventeen years' experience are now centered on quantity production of this new line. The Custom-Built Six is thus brought within the reach of thousands who have wanted such a car. In all desirable sales territories now open, there is immediate business in large volume for dealers who offer this line at the new prices.

Contracts are now being closed with desirable dealers. If you are interested in this exceptional opportunity, write or wire us for further information.

KISSEL MOTOR CAR COMPANY, HARTFORD, WISCONSIN

## KISSEL The Custom Built Car



The cars will be displayed

simultaneously at the

New York Automobile

Show, January 6 to 13,

and at the show-rooms

of the dealers throughout the country. Also at the

Chicago Automobile Show
-Coliseum January

27th to February 3rd.





Speedster

De Luxe Phaeton

De Luxe Brougham Sedan

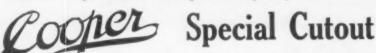
Who's to

Driver?

Danger Signals

Knocking Motor—Missing Spark Plug Leaking Pistons—Loss of Power Difficult Starting—Slow "Pickup" High Fuel and Oil Consumption

There are various causes for these annoyances but the common cause is Carbon. The owner is to blame because he can keep a clean, sweet-running motor by installing a Cooper Special Cutout. The Dealer is to blame because he can explain to the owner the advantages of the Cooper Special Cutout, make a sale and both will benefit thereby. The Cooper Special Cutout gives a free passage for carbon and soot that otherwise is blown into the muffler, increasing the back pressure and causing a carbon-fouled motor. Loosen the carbon with alcohol or a commercial carbon remover and it is easily blown out through the Cooper Special Cutout.



has many exclusive advantages. It is easily installed—simply cut an oblong hole in exhaust pipe and fit Cutout around it. Extra heavy oil tempered, drawn-steel coil spring and heavy flapper are used. Spring and heavy rod axle are not affected by heat, mud or rust. The Cooper will not chatter. Large elongated opening gives carbon and soot free exit. It is simple, durable, practical and economical. Standard equipment on Paige Daytona model.

### Prices Valve Only

1½ in.	\$2.50
15/8, 13/4, 17/8	
2, 21/8	3.50
21/4, 23/8, 21/2, 25/8	4.00
23/4, 21/8, 3	5.00
Cooper Special Cutout complete with pedal for Fords	3.00

When Cooper Special Cutouts are ordered complete with Dash Control, add \$2.50 to above prices. Add 10 per cent to these prices on Pacific Coast. Ask your dealer. Dealers ask Jobbers.



#### Steering Column Support for Fords

Holds steering column absolutely rigid. Takes out all vibration from steering wheel. Adds greatly to comfort of driving, especially over rough roads. A strong casting, black finish. Fits all Fords having instrument boards, both open and closed models. Packed in individual cartons. Price 75c.

### Cooper Mfg. Co., Dept. A

Marshalltown, Iowa.

Name

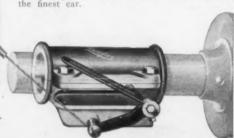
Address ..

Dealer's or Jobber's Name ...



gives instant and complete control of muffler cutouts, exhaust heater valves, air chokes, radiator shutters. Right at your finger tips, always in sight of driver, fits the hand perfectly; a twist of the wrist locks it in any position.

The Cooper Dash Control does not interfere with levers, pedals or floor board—a feature liked particularly by men who service batteries. Installed by cutting half inch hole in dash. Made of brass, polished and nickeled—an ornament to the finest car.



Cooper Mfg. Co. Marshalltown, Iowa. Dept.A. The Fulton Co., Sales Representatives Milwaukee, Wis.

Installed for Cuto

# the ring that "forces lubrication"

UNIVERSAL ONE PIECE PISTON RING

Thousands of these rings are being used by hundreds of repairmen and it is winning new friends daily. The beveled edge and oil groove force lubrication between cylinder wall and piston. Oil collects on the beveled edge and is gradually forced down to the inner groove of the ring on the upstroke of the piston. When firing takes place all excess oil is in the inner groove. The groove forms an absolutely gastight seal.

Ford Special	50c
2%" to 4".	5" \$1.00
4 1/16 " to 4% ". ino	%" width, any above diams. 1.06
41/2" to 47/4".	%" width, any above diams, 1.25



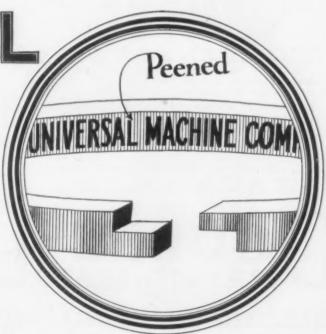
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UNIVERSAL
"HY-GRADE" PLAIN PISTON RING

This ring completes the Universal line. It answers the demand for a high-grade, accurately made plain ring at a reasonable price. Made of the highest grade individual castings known to the art and rigidly inspected to insure greatest accuracy. All of the reputation and standing of the Universal Machine Company is in back of this ring—it is truly great value.

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258"	to	4",	inc30c
456"	to	5",	inc40c

Universal Rings are proving real leaders and profitearners for jobbers the country over. The faithful service of the rings themselves—the genuine and



hearty co-operation of the factory behind the product—the right pricing and straight forward policies these are the reasons for their success.

For jobbers, cylinder regrinder, repairman, motorist-Universal Rings are best.

Let us tell you of the Universal proposition.

UNIVERSAL MACHINE COMPANY, Baltimore, Md.



Do you know-

How to judge them — How to sell them—When to sell them—and why?

I T IS only recently that tire men have come to realize the full importance of tire flaps.

The Dexter Manufacturing Company, largest exclusive makers of tire flaps in the world, have conducted exhaustive, practical tests to determine as accurately as possible the exact value of the tire flap. In these tests, the Dexter Double-D Flap, properly used ADDED AN AVERAGE OF OVER ONE-THIRD TO THE LIFE OF A TUBE.

Think what that means in service to your customers—and Service to your customers is the heart's blood of your business.

#### How to Judge Tire Flaps

THE best way we know to judge the quality of a tire flap is to compare it with the Dexter Flap.

The Dexter Flap is made of the finest materials obtainable. Every process from milling to packing is done in our own plant and rigidly supervised.

The flap itself is made of 4 thicknesses of rubberized fabric and a facing of softest flannel. This
facing unlike most tire flaps, is FOLDED OVER
THE EDGE OF FLAP. This eliminates any
hard edges which might cut the tube and makes the
flap itself much sturdier. The flaps are made in a
special patented machine and are carefully shaped
to conform to the tube. The special compound will
not crack or become hard under friction and wear;

but remains soft and pliable. There is a three hole adjustment so that the flap can be accurately fitted in the tire. It makes a soft cushion, between tire and tube and eliminates friction

#### How to Sell Tire Flaps

THERE is no trick to selling tire flaps. A simple, direct statement to your customer that a Dexter tire Flap will add over 1/3 to the life of the tube will close nine out of ten sales.

#### When to Sell Tire Flaps

YOU can sell one every time you do any work on a tire.

When you sell a tube or shoe sell a Dexter Flap. It is tire insurance at low rates. It means long tire and tube service.

#### Where the Profit Lies for You

IN ADDITION to making satisfied customers Dexter Flaps bear a liberal profit. You'll be as-

Haps in your territory.

We welcome correspondence and will be glad to help you to estimate the possibilities there are for you; and show you what other dealers are doing. Dexter Rubber Manufacturing Co., Goshen, New York

Send this today to

DEXTER RUBBER MANUFACTURING COMPANY Goshen, New York

Please send me your price list and sample of Dexter Tire Flap.

Jame

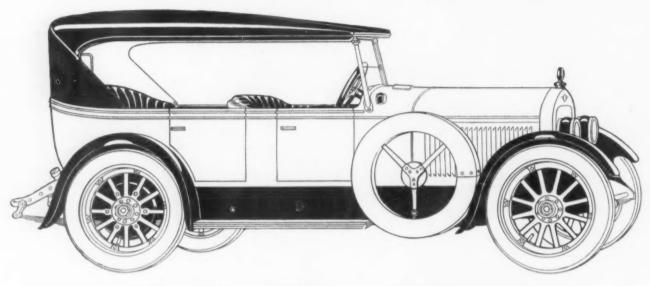
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Again Triumphs

# The New STuTZ SIX



Stutz Six, 5-Passenger Touring

120-inch Wheelbase

GAIN Stutz triumphs! Again a Stutz appears that is destined to make good in a day! Again the name of the Stutz—the original and the genuine—is heralded far and wide for greater achievement.

The new Stutz Six is here—a mature reality. It is in every way a worthy running mate for the famous Stutz Speedway Four, which, itself, has been refined and improved beyond previous excellence. *Prices are phenomenal!* 

Not a light Six—this new Stutz—but a fine, powerful, substantial, roomy car of 120-inch wheelbase with rear springs 62 inches long assuring maximum comfort under all conditions.

Its motor of special Stutz design affords unprecedented economy.

It develops more than 75 horsepower and in high gear is as capable at less than a mile as it is when negotiating better than 70 miles per hour.

Acceleration is achieved with typical Stutz swiftness. Hills fairly melt before it. For be it remem-

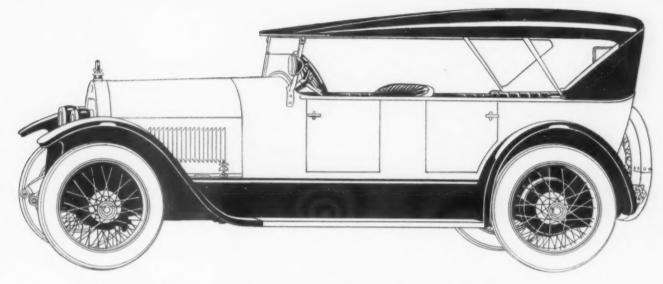
built by the STUTZ MOTOR CAR

Indianapolis.

PRICES
Announced
at the Shows or

upon Application

# and Speedway Four



# Speedway Four, 7-Passenger Touring

130-inch Wheelbase

bered that the new Stutz Six was tested for months in the mountains by the corps of famous Stutz racing experts and approved by them to the last small detail before production was begun.

The new Stutz Six is offered in three distinctive designs for immediate delivery—a 5-passenger touring car; a 2-3-passenger roadster; and a 5-passenger sedan. Each is an utterly new interpretation of the latest vogues.

The finely tailored permanent tops of the touring car and roadster are just one of the many refinements which are ordinarily associated only with cars much higher in price, while in pattern as well as in construction, the sedan ranks with anything available in the field of finer cars.

Dependability, durability, and proficiency! These characteristics associated so inseparably with the Stutz are to be found to a supreme degree in the new Stutz Six.

Here indeed is a product worthy of the enviable Stutz trademark—a real advancement, in its way as impressive as the famous Stutz Speedway Four, beside which the Stutz Six now takes its place in the greater line of Stutz cars for 1923. See us at the shows.



All genuine Stutz Cars bear this emblem and are built exclusively by Stutz Motor Car Company of America, Inc.

# COMPANY of AMERICA Incorporated

Indiana U.S.A.

# MAKE MONEY in 1923

The Stutz franchise was written by Stutz dealers. It reflects their desires and anticipates their actual business requirements. No franchise today gives the automobile merchant a better chance to make money—to build up a permanent, profitable business that will stand four-square to every wind that blows.

Consider what it will mean to be identified with an enterprise that possesses the potential possibilities of the Stutz.

Here are some of the reasons why Stutz should be given every thoughtful merchant's serious consideration now.

- 1 Vast financial and industrial resources under its new control that assure commercial dominance.
- 2 Established good-will and universal prestige that insure a ready market.
- 3 A diversified line of cars that guarantees profitable volume.
- 4 Excellence of product and efficiency of manufacturing methods that build owner satisfaction and repeat business.
- 5 Co-operative standardized service procedure that cuts down the overhead.
- 6 A perpetual contract that safeguards the dealer's future.
- 7 No forced quotas to eat up profits with excessive carrying charges.
- 8 Complete protection for the dealer against price declines.

- 9 Liberal discounts assuring adequate margins of profit.
- 10 Daily check-up between factory and dealer to regulate production and dealer's stocks.
- 11 Territories assigned in accordance with dealer's facilities.
- 12 Infringement difficulties permanently and definitely eliminated.
- 13 Interest paid on all deposits made with the factory.
- 14 Liberal local newspaper advertising and extensive national campaigns.
- 15 Helpful sales promotion and territorial assistance.
- 16 Policies that promote rather than interfere with the dealer's individual control of his own business.

The Stutz offers a business opportunity that no merchant can afford to overlook. Its future possibilities are unlimited.

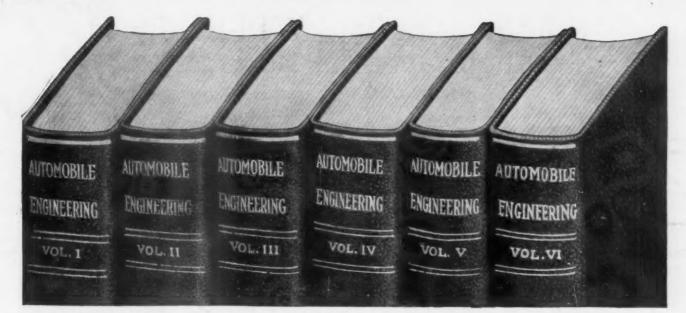
This is the time to become identified with what is destined to be one of the outstanding successes in the motor car industry. We are rapidly developing new territories. Write or wire for particulars or see our representatives at the show.

Grand Central Palace, New York, Space B-4: Coliseum, Chicago, Space M-2
Special Displays and Headquarters: Hotel Commodore, New York; Congress Hotel, Chicago

# STUTZ

Stutz Motor Car Company of America, Inc.

Indianapolis, Indiana, U. S. A.



# Every Automobile Man Needs These Auto Books

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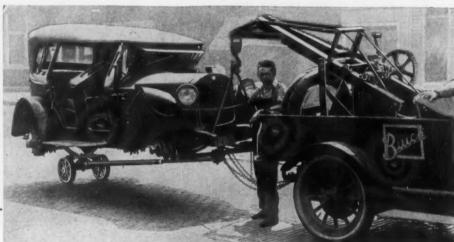
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Send me the 6-volume set of Automobile Engineering books for a week's free trial by express collect. I will either return the books in one week at your expense or send you \$2.80 as first payment and \$3.00 every month until a total of \$21.80 is paid.

# "You Said it—The Well-Equipped Shop Gets the Business"

Read what this enthusiastic dealer from Illinois says

This is the wreck that was handled by Mercer and Hauter of Princeton, Ill., with their Manley equipped Service Car, using the Manley Wrecking Crane and the Manley Double Post Towing Truck. Both 100% efficient.



MERCER & HAUTER

Princeton, III.

Manley Manufacturing Co.

Gentlemen:

I wish to say the two pieces of Equipment show the picture of the first thirty

You say it all when you say, proof enough to serve without the Equipment.

No shop is complete without this Respectfully,

Mercer & Hauter.

See how the Double Posts straddle the differential and take the whole weight of the car.

The Manley

Double Post

Towing Truck



THIS Hupp car went over a bank. All four wheels were broken. This necessitated bringing it back on the road. The Manley Crane did it, easily.

The Manley Double Post Towing Truck was then used to support the rear end as shown, the Crane on the Service Car taking the front end.

These two pieces of Manley Wrecking Equipment are the only combination on the market which could have performed the job.

Just imagine the fee Mercer & Hauter received for this job, then think it over and see if you too should not be Manley equipped for this paying kind of service work.

When you buy a Towing Truck, you expect to get one which will handle a disabled car if both wheels are damaged, or it has a locked differential, etc. Unless you buy a Manley Double Post Towing Truck, you cannot handle such cases as these. The massive I-beam body, the heavy 2" telescoping pole of the Manley Truck are also vital necessities.

Note also how the pads of the Double Post swivel to conform to the shape of the axle and the weight is taken on the wide fifth wheel directly over the wheels. 100% right.

Send for complete details. Free for the asking.

THE MANLEY MFG. CO., YORK, PA.

"The Well-Equipped Shop Gets the Business" with

Manley
Garage Equipment

See our Exhibits at the New York Auto Show, Space D-45 & 46. At Chicago-Coliseum Annex, Space 165-168.

# You Can Purchase a Curtis with the Confidence It Is Right

Confidence because it is a product of experience, a reliable, tried and proven article-because CURTIS Engineers first recognize, then study and solve basic problems. The correctness of CURTIS' design has been proven repeatedly by the later adoption of these self-same CURTIS features by others. CURTIS Compressors are built to render steady service with a minimum operating expense. A few reasons

- 1 Controlled Splash Oiling System, originated by Curtis. This patented feature prevents an excess of oil getting into discharge line. At the same time perfect lubrication is assured. Curtis will run many times longer on the same amount of oil than ordinary splash oiling compressors.
- 2 Hand Unloader, originated by Curtis, permits starting against full tank pressure. Prevents burning out motors, blowing fuses or jumping belt.
- 3 Safety Cage, originated by Curtis, prevents broken valves dropping into cylinder and wrecking machine.
- Fan Fly Wheel, originated by Curtis, helps cool the cylinder (and the intercooler on two-stage machines). Increases capacity.
- 5 First and only Two-Stage Compressor with a Copper Inter-cooler, originated by Curtis, assuring fullest advantage of Two-Stage Compression.
- **6** Back of every Curtis outfit is 69 years' successful experience, 26 years of which have been devoted to the design and manufacture of air compressors.

We manufacture a complete line of both single and two-stage air compressors. A style, size and arrangement to meet your partic-ular need. Write at once for full details and prices.

#### Curtis Pneumatic Machinery Co. 1527 Kienlen Avenue St. Louis, Mo., U. S. A.

Branch Office: 530-H, Hudson Terminal, New York City

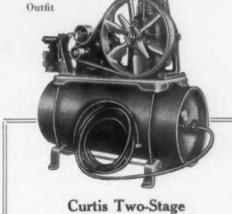
Canadian Representative: Joseph St. Mars, Winnipeg and Toronto, Canada.

# "An Original Design"





Style "X" Single-Stage Outfit Portable, Belted or Geared. Five sizes. A.C. or D.C. Motor.



Style "V"

Two-Stage

In a TWO-STAGE machine the air, which has been heated in compression, is cooled while passing through the intercooler from the low to the high-pressure cylinder, thus permitting the high-pressure cylinder to handle a larger volume of the cooler and denser air. The efficiency of a Two-Stage Compressor depends directly on the degree of intercooling effected.

The degree of heat thrown off by an inter-cooler depends upon the kind and thickness of the metal and the design of the inter-cooler tube and radiating flanges.

Copper throws off heat faster than any other commercial metal. 135% faster than cast iron, 112% better than steel and 27% better than aluminum. Curtis intercoolers are made of copper.

Curtis intercoolers are approximately 50% longer and have about 100% more heat radiating fins than others. They are exposed their entire length to the cool blast of the fan fly wheel.



Style "Z" Single-Stage Outfit

Belted only. 1/4 to 3 H.P., A.C. or D.C. motor. Five sizes.

Coupon

Pneumatic Machinery Co.

1527 Kienlen Avenue St. Louis, Mo.

IS Single and Two Stage Air Compressors

Please send me full details on Curtis Air Compressors, your proposition and prices.

Gentlemen:

Jobber's Name .....



# Our Claims Are Based on Facts

The only claim worthy of consideration is the one supported by proof. In making our claims for superiority in **TRINDL** products we are prepared to demonstrate that in every detail we practice what we preach.

Accuracy—Absolute roundness and uniformity of diameter is guaranteed by the use of the latest types of automatic production machinery.

Hardness and Strength—Special heat treatment, scientifically controlled, gives TRINDL Piston Pins an extreme hardness that insures the longest wearing period to the surface. The core is close grained and tough, which gives them the needed strength. TRINDL Piston Pins wear unusually long—they are made right from start to finish.

Ample Stocks—Quick Service—We always have on hand an enormous stock of practically all pins for immediate. shipment. These include standards and oversizes. Specials are made up and shipped in twenty-four hours. No delay on hurry up and emergency jobs. Our service has earned us many customers and friends—it pays you well to know where to get your parts in a hurry.

High Lustrous Finish—Final polishing of TRINDL Piston Pins on special machines, imparts a fine mirror finish that identifies the pin as a TRINDL product.

Handy System of Marking—To simplify the handling of TRINDL Piston Pins and to eliminate measuring and confusion, each pin is plainly marked with size and stock number. This makes identification possible at a glance. The process of marking is patented and marks a step forward in reducing errors and loss of time and income.

Distinctive Packages—TRINDL Piston Pins are packed in substantial cardboard boxes of attractive appearance. The whole data of the contents is carried on a label which shows the number of pins, their size and stock number, the style and the make and model of car, truck or tractor to which they fit. The boxes are sealed; the pins are protected against rust and dirt. An intact seal is a guarantee of perfect contents.

Specification of Sizes, and Price List—Our size specifications are the most complete so far compiled. Stock numbers, make, model, year, motor, number of cylinders, size of pins, prices and other information guarantee you the right pins. The most inexperienced stock boy can order correctly from these lists. Our numerical list—the first over issued for the trade—shows the duplication of pins for various motors and guards against overstocking on popular sizes.

Prices-TRINDL prices are in accord with the quality of the product and the perfected production methods we use.

Trindl Piston Pins and Trindl Warp Proof Valves are sold by jobbers throughout the country. Write for the name of the jobber nearest you who stocks them.

# Piston Pins is in These Two Books. Send for Your Copies.

All mystery and element of chance in ordering Piston Pins has been removed by our two books of Piston Pin data. If you ever intend to replace a single pin, or have become confused in ordering the right pins for jobs you have done, you need these books. Everything is worked out and simply detailed. Write for these two baoks today. Also ask for the TRINDL Super Warp Proof Valve data, the book that tells you about the new valve that is "going over big" everywhere.

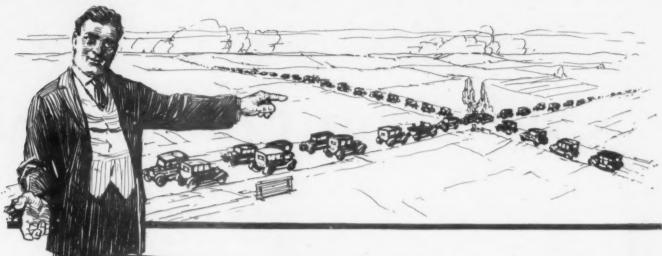
#### THE TRINDL CO.

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Chicago

Milwaukee Branch: 615 Wells St.







Case moulded from
Bakelite.
Short - circuiting impossible.

Rotor, with special contact shoe. Also copper contacts moulded in place.



With the Bell Rotor, perfect contact and accurate timing is inevitable. A special spring bears against the contact shoe, and if there is any end play of the cam shaft the spring coils automatically wind and unwind—maintaining a constant, even pressure on the raceway.

The Bell case is moulded from Bakelite. Dirtproof, dustproof, waterproof. No oiling necessary.

Send for illustrated descriptive data.

\$3.00

# Here's Where A Timer Gets Its Real Test

-on the highways

There is no better way of proving a timer's worth than watching it perform right out on the roads, where it encounters all conditions: bumps, shocks—even the elements.

### Not In a Test Laboratory

For while the laboratory, with its experts, may be able to record approximately the conditions under which a timer must labor, it can never duplicate the severe service of the highways—where expert attention is no part of the test.

#### The Bell Timer Has Made Good On the Roads

It is a decided success. Its construction assures the one big essential to accurate, uninterrupted timing service—a perfect electrical contact, permanently maintained.

#### And That's Why Dealers and Service Men Prefer to Handle the Bell Timer

Bell's popularity with Ford owners assures quick sales and good profits. It will be well worth your while to learn the details of our unusual trade offer. Sent on request.

BELL MANUFACTURING CO. BOSTON, MASS.

The BELLTimer

# C-O Shop Equipment

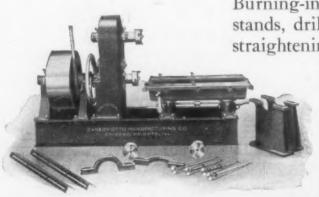
When you install C-O equipment, you get the best there is. Up-to-the-minute in design, unequalled in efficiency, and thoroughly dependable, it enables you to give the best service at the lowest possible cost.

Such service builds business by making friends and attracting new trade. It assures prosperity and progress. It keeps you ahead of competition.

Each unit of C-O equipment is designed from practical shop experience, by practical shop men. It fits into your business as though made to your particular specifications.

Burning-in machines, motor and axle stands, drills of all types, arbor and straightening presses, grinders, buff-

The C-O Universal Burning-In Machine fits 95% perfect bearings in any type or size of engine in from 45 minutes to an hour. Compare this with hand labor! Bearings are in full view during burning-in operation. Single control of table assures perfect alignment of work. Silent chain drive makes detection of motor noises certain.





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\* ers, cranes, connecting rod and piston aligners, battery tools—these and other shop essentials are made in a variety of types and sizes to fit your exact needs.

Being fabricated complete in the efficient C-O shops, each unit is not only exceptionally well made and dependable, but also comparatively low priced.

Such good equipment will put your business on a more secure, more profitable footing.

Consult your jobber, and also write for our big catalog, showing the complete C-O line, unequalled in efficiency, quality and value.

Address Dept. A

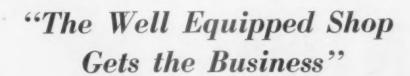
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Manufacturers of Automotive Equipment, Drills, Punches, Shears, Shrinkers, Countershafts, Grinders, Buffers, Forges, Blowers, Tuyere Irons and Blast Gates

Main Office and Factory—Chicago Heights, Ill. New York Branch—407 Broome St.



Under the C-O Credit Plan, the secured at once, with investment of only one-fourth of the cost. Increased earnings easily take care of the balance and show a handsome profit besides. Your jobber will be glad to supfull information, without obligation.



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motive machinery.

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"Built Up to a Standard, Not Down to a Price"

At every Automobile Show, the moving tide of humanity slows up at the Dorris exhibit, spellbound by the sheer beauty of the car.

The Dorris is practically hand built, and looks it. Even the untrained eye recognizes the stately grace of its build, the unerring good taste in its appointments, inside and out.

But you will be no less appreciative of the marvelous power plant beneath the hood—the famous Dorris six-cylinder, valve-in-head motor and the Dorris Distillator, now standard equipment in all Dorris 6-80 models. To say that Dorris engineering is beyond compare, is a simple statement of fact. For seventeen years it has maintained an unquestioned leadership among the finer cars.

Dorris performance is well nigh flawless, at any speed, on good roads and bad, winter and summer.

Dorris endurance is a byword among owners and throughout the automobile industry. Distributors count their profit as net when the sale is made, since there are virtually no calls for service.

The Dorris franchise is offered to forward-looking distributors in open territory—men accustomed to serving people of means and fine discrimination.

DORRIS MOTOR CAR COMPANY

Saint Louis

INC.

# This Record Helps to Close Used Car Sales

Every prospective buyer of a used car wants to be convinced that he is not going to be stung. It is nothing more than good merchandizing on your part to lay all the cards on the table. Comfort's Used Car Record does this in a convincing manner. It will show what you paid for the car and what it cost you to re-condition it. Also it will show that you are taking only a fair profit.

About the easiest way to lose money that we know of is to overhaul a car for re-sale and then depend upon your memory as to what the costs were. It's just pot luck if you don't lose money or the customer.

The Used Car Record protects you from mistakes, saves time and assures you correct profits. You can't forget a thing and you are primed to talk turkey to your customer.

The Used Car Record comes in book form—200 pages of heavy white paper—one page each for recording. The book is neatly bound with a canvas back. Pages are 11x8 inches in size.

Every dealer who handles used cars needs this book. You need it. Order it now while you think of it. To put off is to forget.

Fill in and send the coupon below and also note whether you would like a copy of our free cloth-bound book, "Making and Saving Profits." It has a helpful, profitsaving suggestion for every department of your business.

All Comfort Forms are built exclusively for your business. They virtually think for you.

We pay shipping charges to your city on ALL forms

COMFORT

Printing Specialty Company

101 North Eighth Street, St. Louis, Mo.

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SALES RECORD

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rome 2740 Cash I note 2000 pay four 15-1 note 2000 pay Jeb 15-1 note March 15 1000 6% Int.

Ourhauled Generator and bores Cylinders-

Price \$350 We Pay
Shipping Charges

Comfort Printing Specialty Co., 101 North Eighth Street, St. Louis, Mo.

Enclosed find check or money order for \$3.50 for which please send me Comfort's Used Car Record, shipping charges to be paid by Comfort.

Name \_\_\_\_\_\_

Address



National Advertising Campaign
1923
THE S.I. EVEN.

THE SATURDAY
EVENING POST

# A Big Year for Biflex Dealers

1923 will see a powerful advertising campaign on Biflex Bumpers. It will reach millions of motorists. Every motorist in your city will know about Biflex. Biflex advertising is an asset to every auto and accessory dealer. It is the influence that makes motorists insist on Biflex, the original double-bar bumper. Follow the lines of least resistance, hook up with Biflex, cash in on Biflex popularity and Biflex advertising. Get your share of the business.

Tell 'em you sell Biflex.

Auto dealers wishing to increase car sales are invited to write us for sales plan entitled "How to Close the Sale."

Biflex will be exhibited at the New York Automobile Show, Grand Central Palace, January 6 to 13, 1923. Also at Chicago Automobile Show, Coliseum and First Regiment Armory, January 27 to February 3, 1923.

BIFLEX PRODUCTS CO.

WAUKEGAN, ILL.



TRADE MARK

"Protection with Distinction"

Town & Country

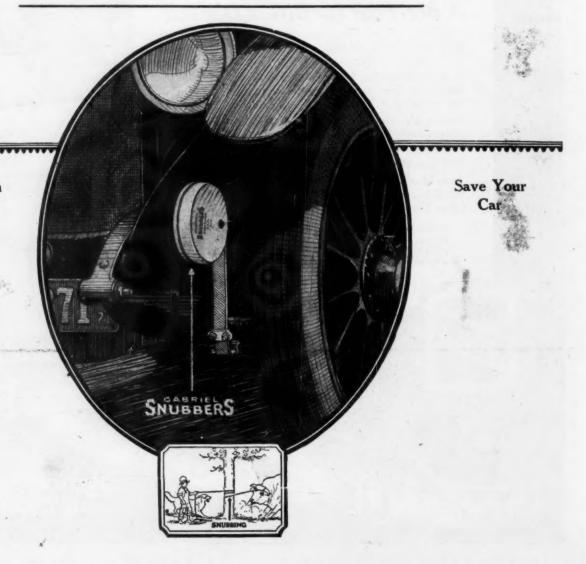
# Do Not be 'Gypt'

THERE is only one Snubber—the "Gabriel". Thirty-seven leading cars are standard-equipped with Gabriel Snubbers. Thirty-four other makes have their frames drilled for them.

Sold by Legitimate Dealers

GABRIEL MANUFACTURING COMPANY
1415 East 40th Street Cleveland, Ohio

# SNUBBERS



Keep You on the Seat



Every dealer who goes to the New York Show and fails to see the new Rickenbacker series-

-and also fails to investigate the new Rickenbacker agreement is just cheating himself.

Second floor at the Grand Central Palace. Also, Commodore Hotel.

Touring Phaeton-\$1485; Coupe-\$1885; Sedan-\$1985;

f. o. b. Detroit.

Rickenbacker Motor Company Detroit Michigan



strom

# Are Standard Equipment on Most of America's Fine Cars

Under unusual loads and high speeds, bearings will soon reveal whether or not they can be depended upon for satisfactory service.

Strom Bearings have met the demands of the most discriminating engineers. Their confidence is based on performance records, careful design, high-grade materials, and accurate workmanship of these bearings.

The Strom catalog contains sizes and load-carrying capacity data covering all standard bearings. You should have it on file.

# U. S. BALL BEARING MFG. CO. (Conrad Patent Licensee)

4551 Palmer Street

Chicago, Ill.



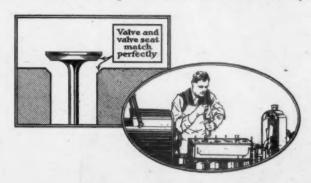
"Wherever a Shaft Turns"



# A Real Machine Tool For VALVES

WORN, pitted, leaky valves reground like new within one minute.

Valve-seat reamers ground to match, so that a few seconds' lapping in the usual way results in a job the absolute equal of that done at the factory.



Valvo also grinds tappet rollers, squares up tappet heads, valve adjusting screws, distributor points,—collets can be furnished to hold any valve stem up to 9/16" diam.

Individual motor-drive for both wheel head and work head. No shafting, no belts, no floor space; stands on the bench in any position.

Built by machine-tool builders—you know what this means. Yet it costs but \$175. Write for photographs and specifications.

VAN NORMAN MACHINE TOOL CO.
Springfield, Mass.

Mfrs. Raceway Grinders and Duplex Millers



# STEELBALLS

Manufactured to the highest

standard of accuracy and linked to a world-wide good will and reputation. Nowhere will you find a ball that so nearly embodies the features of accuracy, uniformity and quality as ATLAS STEEL BALLS.

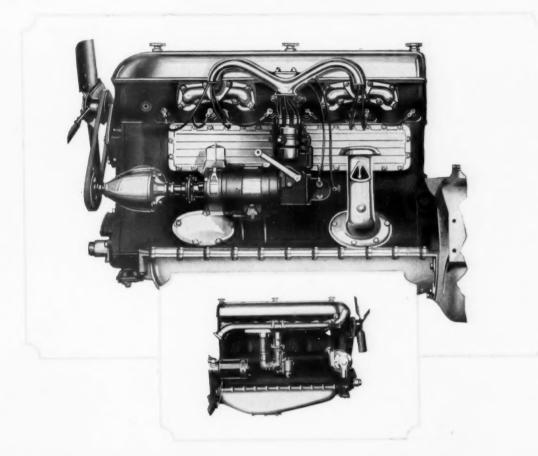
ATLAS BALL COMPANY

Glenwood Ave. at 4th Street
PHILADELPHIA

712

# DUESENBERG

Original Straight Eight . The Grand Prix Car



ERHAPS the most exalted episode in American automobile history is the Duesenberg victory in the French Grand Prix. No automobile honor in the world is so coveted.

It was the climax of the quite unvarying racing success of Duesenberg-designed cars in the United States and elsewhere, culminating in a matchless array of world records credited to Duesenberg.

In sponsoring a passenger car Duesenberg has realized its purpose of preserving in an automobile of utter gentility and irreproachable good taste the highly desirable attributes of victorious racing design—indomitable ruggedness to minimize the need for attention—power without practical limitation—a degree of safety beyond the remotest necessity.

In Duesenberg cars this implies engineering so advanced as to anticipate the years through which a car so fine will serve.

# Eight Cylinders in Line

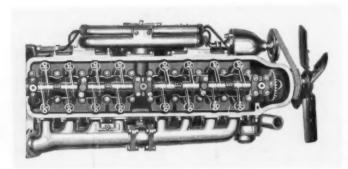
Raise the bonnet and much of the inspiring story of the Duesenberg is clear. The straighteight principle, first applied in a passenger car in the Duesenberg, commends itself never so emphatically as in this incredible cleanness and compactness of a multi-cylinder engine.

The single, trim, sleek cylinder block with eight vertical cylinders overcomes the inevitable tendency to vibration in any other multi-cylinder arrangement. There is also no question as to unequal wear on the sides of the cylinders. All accessory units, wiring and manifolds are deftly disposed to either side of the block. That multi-cylinders might be so presentable, so unencumbered, has been inconceivable.

# Overhead Valve Drive

Even the entire valve gear, simplified beyond precedent, is wholly outside the cylinder block

# Duesenberg Straight Eight . The Grand Prix Car



The detachable cylinder head carries the entire valve mechanism including the overhead camshaft. Here is one of the rare examples of complete, correct valve lubrication. Duesenberg valving accounts for much of the high proficiency of the car

proper. A single overhead, gear-driven camshaft, not duplicated in American practice, actuates the valves.

Valve lubrication—a vexed problem in motor design—is perfected in the Straight Eight. Positive, controlled, complete lubrication, even to the valve stems, virtually nullifies wear. Consequently the initial quietness is perpetuated.

The valves are set at an angle. They open into a combustion chamber most closely approaching the ideal spherical shape. An unconventional position of the spark ports entering the combustion chamber has been calculated to impart a



The combustion chamber of the Duesenberg Straight Eight is of perfect hemispherical section—a remarkable piece of machine work—and the nearest approach to the theoretical ideal for peak power development

distinct circulating effect in exploding the mixture. The rapid, thorough combustion in the ideally shaped, completely machined combustion chambers effects unexpectedly high fuel mileage. Carbon formation is retarded.

Even more vital, the perfectly equalized compression eliminates an ordinarily ignored source of vibration and deterioration. Intimately related to this result is the rare practice of completely machining the intake passages—eloquent of the utter refinement of the Duesenberg.

# Rational Pre-heating

This ingenious engineering permits, among other advantages, very accurate calculation and control in pre-heating the mixture. In conjunction with the heat-duct through the cylinder block and the highly scientific uniflow manifold, the incoming gases are treated with intensified effectiveness throughout the range of operation.

Extreme power output for an engine so compact and frugal is further safeguarded by exceptional control of the heat radiation. Water passages and water circulation have been very accurately devised. Automatic thermostatic control is fitted to insure correct operating temperature under all conditions. Distortion is unknown. Valves are properly cooled.

### Lubrication

The extreme lubrication requirements of racing are the basis for the exceptionally effective oiling system of the Duesenberg. Many important improvements and interesting niceties are embodied here as throughout the motor.



Note the hollow sections of the crankshaft containing inserted steel sleeves. In effect, a shell of oil is fitted inside the crankshaft, no unnecessary quantity of oil being carried in the shaft. This is an excellent example of the costly but utterly complete refinement of the car.

Its special lubricated forward mounting, patented, thwarts the possibility of misalign-



Duesenberg tubular connecting rod and alloy piston with cut-away skirt. A distinct scientific advance is represented in this construction ment and undue strain. The tubular connecting rods are completely machined and grooved on the lower ends to relieve weight. Piston design is uncommon in many respects. For lightness with extreme

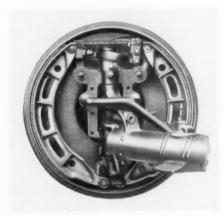
strength, aluminum and costly alloys are lavishly employed. There are innumerable further examples

# Duesenberg Straight Eight . The Grand Prix Car

of the consummate finesse of Duesenberg engineering. Throughout the design the technical expert finds the certain credentials for the rare elation experienced in the possession of a Duesenberg.

## Four-Wheel Hydraulic Brakes

As with the motor, the Duesenberg chassis is characterized by an absence of complication so complete as to be momentarily puzzling. The explanation is found largely in the four-wheel hydraulic brakes.



In this view of one of theforward brakes (completely enclosed in operation) note the tubular front axle and the double steering arm, one of the very few examples of its kind. It provides the extreme strength of racing practice in a passenger car.

Displacing entirely all of the rods, levers, joints and inevitable noise of mechanically operated brakes are four \(^3\)\sections-inch metal tubes, leading to the four wheels. There are only two flexible joints, very limited in motion, and fully protected high in the chassis. Pressure upon the brake pedal, in the usual manner, depresses a small piston in a chamber under the floor-board. Oil pressure, that may be increased up to 500 pounds, operates the simple mechanism within the brake drums which applies the brake shoes.

The action of the liquid makes unequalized braking nearly a physical impossibility. Braking without the risk of skidding now exists.

It is the high factor of safety inhering in fourwheel brakes which makes feasible the full use of Duesenberg power. At thirty miles an hour, a standstill in *one* car length is possible without sliding tires; at fifty miles in only about five car lengths; and correspondingly at greater speeds. Four-wheel brakes require the application of only one-half the usual braking effort. Tire wear is notably reduced, the braking strain being distributed over four wheels.

The manifestly better heat radiation of four brakes is enhanced by cooling fins integral with the brake drums. They are *forged* for extreme strength and ground for a perfect braking contact—illustrative again of Duesenberg construction. Dragging brakes are unknown.

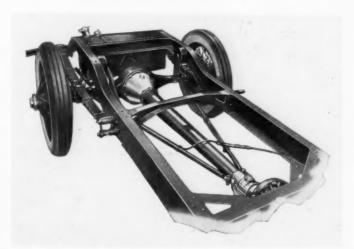
### Tubular Front Axle

To withstand the braking torque of the front wheels, and yet introduce no excess weight, a tubular front axle of molybdenum is employed. Again Duesenberg puts into practice the engineering ideal—the lightest axle of maximum resistance to road shock from all directions.

The forward position of the front axle forms the low cradled suspension which contributes to the serene, skimming-like riding quality attained, and cushions the power plant. The radiator, likewise, has the protection of a cantilever mounting entirely clear of the forward cross member.

# The Torque System

Not less mature in design than the hydraulic brakes is the hand brake on the propeller shaft. The load has been concentrated upon the torque



The special magnalite torque yoke shown here, the gun-barrel type of torque tube, and the radius rods form perhaps the most highly developed system of its kind in use today. There is absolutely no brake linkage other than the small tubes fastened to the radius rods. The frame is double heat-treated and tempered. The rear axle housing, like the forged shafts, is molybdenum steel. The outboard springs have double shackles.

# Duesenberg Straight Eight . The Grand Prix Car

tube yoke, shielding the universals and transmission. The entire layout for smoothly and silently absorbing torque reactions exhibits the closest study to endow the car not only with luxurious ease of riding but also with the sure



The Duesenberg Rear Axle is utterly devoid of the usual brake linkage. The axle housing is molybdenum, as are the axle shafts. The pinion housing is of magnalite. Here is perhaps the most highly developed and costliest rear axle in any motor car.

ability to cling to the road even in circumstances as extreme as may be occasioned by the full use of the power available.

The double strength, double heat-treated frame—each rear axle and its hub forged integral—

the massive steering apparatus—every unit bespeaks the purpose to scale the entire car to its phenomenal power plant.

### Coach Work

Thoroughly in keeping with this purpose, a series of full aluminum, ultra-luxurious bodies have been designed. Both open and closed models may be said to interpret the very spirit of swift, silent, effortless flight. The wheelbase of 134 inches allows full play for the art of the coach designer. The fine car seems to take on a new majesty in the Duesenberg. Exquisite nicety marks the fitting out of all types. Even the motor connoisseur will be impressed by the improvements in providing lavish personal comfort.

Such a car could not fail to be epochal. It has proved how rugged and simple the most refined multi-cylinder automobile can be. Its acknowledged place is in the forefront of the small internationally composed group of cars which are first in the world.

Applications for the Duesenberg franchise are being considered. Complete information upon inquiry.

DUESENBERG AUTOMOBILE & MOTORS CO., Inc., INDIANAPOLIS



# Why is a Used Car?

A short time ago The Cincinnati Enquirer published a series of Used Car articles that have lived long after their publication. This series ran the entire gamut of used car argument; the effort of the dealers to curb certain practices; the relation of the factory to the used car market; and the "shopper" whose main object was to get the next dealer to increase the allowance on his old car.

Dealer organizations throughout the Cincinnati territory have made various uses of these articles.

This is the character of news items that help to make the Automobile Section of The Cincinnati Enquirer interesting. By promoting reader interest it is promoting the cause of the advertiser. It is one of the big reasons why Cincinnati dealers derive their best results from the advertising columns of The Enquirer.

Year after year The Enquirer has led all Cincinnati papers in automobile advertising, carrying more display lines than all the other Cincinnati papers combined.

# The Cincinnati Enquirer

One of the world's greatest newspapers

Bob Beiser-Automobile Editor

1923 AUTO SHOW EDITION FEBRUARY 4TH

Any dealer desiring a set of reprint copies on the used car items can secure same by sending in this coupon.

Cut out and mail today.

The Cincinnati Enquirer,

Automobile Editor

Kindly send me free reprint copies of used car items.

Name

Town

State .

# The Ring That Does Away With Comebacks!

THERE are no comebacks for the dealer who installs PERFECT CIRCLE Oil-Regulating Piston Rings, because these rings deliver the goods!

They stop oil-pumping and give an oil-mileage of 1000 to 1500 miles to the gallon. They regulate the oil without scraping the cylinder walls. And they provide positive lubrication, always.

Perhaps the most convincing evidence of this is the enthusiasm of dealers who install Perfect Circle Oil-Regulating Rings—men who know the service they give, and the profits they bring. Write for a trial set today.

PERFECT CIRCLE Oil-Regulating rings work best when used with PERFECT CIRCLE Compression rings. However, other good compression rings may be used with excellent results. Only one Oil-Regulating ring is used to a piston.

PRICE \$1.00 EACH

Up to and including 5 in. diameter

Compression Type 25 ∉ and up.

Standard equipment in-

STUTZ
HAYNES
MARMON
DUESENBERG
WEIDLEY MOTORS
WISCONSIN MOTORS
WAUKESHA MOTORS
FAY & BOWEN MOTORS
AHRENS-FOX FIRE ENGINE

TEETOR



**PISTON RINGS** 

Patented March 29, 1910 May 2, 1922

Marketed through recognized automotive jobbers, only.

Indiana Piston Ring Company

Hagerstown, Indiana

Harkrader & Harkrader: Western Sales Agents, 1603 S. Michigan Ave., Chicago

# THE WAUKESHA MOTOR COMPANY

wishes to announce
an entirely new type of

Engine

capable of exceptional economies in

Bus and Truck Service

The Sales and Engineering Departments
welcome the opportunity
to present these Engines and their performance
to all patrons of the
New York and Chicago Automobile Shows
and to all those
who will honor them with a request
for detailed information

Waukesha, Wisconsin January 6th, 1923



"G! What a hard time they had to sell me this PEP watermixed compound to grind my valves!

"I go easy on new stuff that's supposed to save a lot of time.

"But three years ago I got so reckless I spent a penny for a postcard to ask for a free sample of PEP and tried it out on some rough old valves that ought to have gone to the lathe.

"It ground them so fast and gave such a swell, even finish that I'm sold for life on the stuff.

"I tried a free sample of PEP "Safety First" Babbitt Bearing Grinding Compound the other day, too. Best I ever used, and the first at a decent price—half what I've been paying.

"Get wise to these two things, friend."

Look

THEY SIFE. CO. SERVED PRIESE SENTINE PO

# The Leading Air Compressor of a Superior Type

A S applied to garage and service station air compressors, the *Two Stage* principle has long been proven superior.

Foremost in this type stands the *Usaco* Compressor, a pioneer in the field and trail blazer in the introduction of improvements and refinements.

Any unit in the complete Usaco Line is a composite of scientific design, perfectly balanced and liberally proportioned parts, highest grade materials and specialized manufacturing effort.

To purchase a Usaco Compressor means to obtain the utmost service for years to come with remarkable economy and minimum attention.

> The Usaco Catalog tells the complete story in an interesting way. Write for it.

The United States Air Compressor Co.

5304 Harvard Ave. Cleveland, Ohio

### Some Outstanding Features

The Usaco Unloader

an exclusive, patented feature which automatically safeguards against the most prevalent damaging conditions to which air compressors are subjected.

40 Degree Repulsion Induction

Will withstand great overload without damage. The most expensive motors it is possible to buy.

Cylinders Cast En Bloc

assuring perfect and permanent alignment which means a greatly prolonged life of usefulness.

An Indestructible Intercooler

in conjunction with an Improved Fan Type Flywheel results in practically perfect cooling with attendant high efficiency.

Filtering Trap and Automatic

Moisture Unloader combine to assure that only clean dry air will enter tires.

It is to Your Interest to Obtain

Complete Information About These and Several Other Usaco Features.



Two Stage 9



Single Stage

for Economical Transportation



# Trade Headquarters

Mezzanine Balcony

# Hotel Commodore, Jan. 6 to 13 inclusive NEW YORK CITY

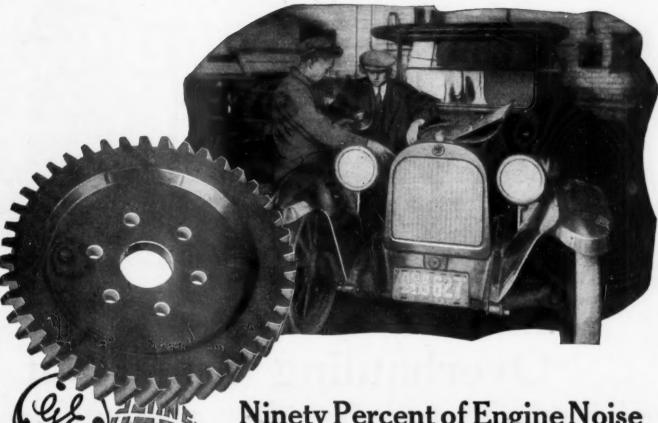
A general invitation is extended to the automobile trade to call at our headquarters during the week of the National Automobile Show, where representatives of this Company are in attendance.

Chassis with the new copper-cooled motor is also on display at these headquarters.

Applications for the selling rights of this Company's product will be considered here.

# CHEVROLET MOTOR COMPANY

Division of General Motors Corporation DETROIT, MICH.



Ninety Percent of Engine Noise Is in the Timing Gear Train

When a Dodge owner complains of a noisy engine, the chances are ten to one that most of the racket is in the timing gear train. There is one best way to eliminate permanently the noise from timing gears—put in a silent cloth gear called

A product of General Electric Company

This gear is made up of layers of canvas impregnated under pressure with a special compound. This compound, when hardened, holds the layers permanently in compression, since they are welded, as it were, into a single unit. a gear that will outwear cast iron yet has all the advantages peculiar to non-metallic gearing. It eliminates noise, absorbs vibration and lengthens the life of the whole gear train. It is unaffected by oil, heat or anything else to which it will be subjected in service. Also, textolite gears can be stored indefinitely without suffering from atmospheric conditions or vermin of any kind.

The proper textolite gear can be supplied promptly for practically any make of car using timing gears.

Distributed to the Automobile Trade by

# JOHN C. HOOF & COMPANY

157 W. ILLINOIS ST.

SPACE 99

SEE OUR EXHIBIT AT THE SHOWS

CHICAGO......SPACE 90
IN COLISEUM BASEMENT

NEW YORK ...

CHICAGO, ILL. 454



Model G. This is one of the most popular models we have brought out. As shown to the right, a ten-year-old boy can raise the average passenger car to the maximum height in from one to two minutes.



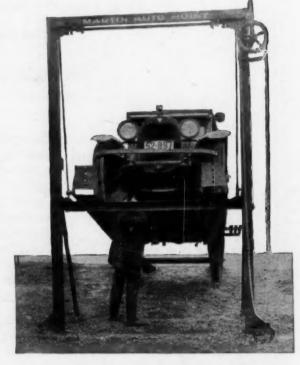
# Service Managers Think this over— Overhauling Time Cut \( \frac{1}{3} \)

FLAT RATES demand that every repair shop find the quickest possible way of getting work done. With the Martin Auto Hoist you can get work out in from 1/3 to 1/2 the usual time. This is being done every day in dozens of busy repair shops.

Simply Martin Auto Hoist the car to a position which permits your mechanics to get at it—easily, naturally, not lying on their backs under it, but standing straight up or sitting on a comfortable stool. Away with creepers and fire-hazardous pits. The Martin Auto Hoist is proof that "position is everything."

With the Martin you don't even need to empty the radiator or tank, or remove battery. And it is SAFE, absolutely. No jacks. No lost floor-space with the Martin—when not in use, a car can stand on it. Several models, all covered by broad basic patents. EASY PAYMENTS. Write for special plan which permits you to pay for your Martin out of the PROFITS it earns for you. Remember—it saves big money on every job. Printed matter free.

AT BOTH AUTO SHOWS. Don't fail to look us up at New York or Chicago. Booth C-11-A, third floor. Biggest exhibit at the Shows from the Service Manager's standpoint.

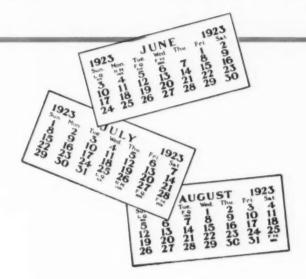


Model "L" particularly suitable for gasoline filling stations. Used in draining crank cases and greasing cars.



The T.A. MARTIN EQUIPMENT CO., INC. BRIDGEPORT, CONN.

# Summer Performance



#### LL THE 1923 SEPTEMBER 1923 3 3 4 5 5 6 7 7 1923 1923 26 27 21 15 1923 1923 FEBRUARY 1923 1923 7 14 121 21 128 1923 DECEMBER 1923 DECEMBER 1923 DECEMBER 1923 DECEMBER 1935 DECEMBER 1945 DECEMBER 1945 DECEMBER 1956 DECEMBER 1957 DECEMBER 1957 DECEMBER 1958 D 185229 3 852 25 29 JANUARY 100 100 110 100 100 100 110 100 110 100 110 100 110 100 110 100 110 100 110 100 100 100 100 100 100 100 100 100 100 100 100 100 100 1925 52 3 9 10 16 17 23 24 50 31 MARCH Tue wed Thu 157 8 13 14 15 20 21 22 27 28 29 192: 55 4 11 18 25 × 35 12 19 26 196 E 1923 OCTOBER Tue Wed Thu 2 3 4 10 11 16 17 18 23 24 25 30 31 NM 1925 6 2 13 2 20 2 27 1923 10 6 17 3 24 NOVEMBER Toe wed the 15 7 8 2 13 14 15 9 20 21 22 6 27 28 29 1923 N Sun Mon 19 12 11 12 18 19 25 26 9 16 23 30 1923 Sun Mon 1 2 8 9 15 16 22 23 29 30 1923 7 5 14 9 21 28 APRIL Tue Wed Thu 3 4 5 10 11 12 17 18 19 24 25 26 1923 555 566 7 13 14 20 21 27 28

552 19 26

# Now-

# A simple, positive, automatic control of the cooling system

Summer efficiency at winter temperatures—these five words tell the story of the Bishop-Babcock Aquastat in its relation to the water cooling system of all cars using circulating pumps.

The Bishop-Babcock Aquastat has been thoroughly tested, thoroughly proved. It is simple, positive, automatic in its operation, being an improved and highly perfected adaptation of the thermostatic control now used successfully on a number of the higher-priced cars.

Its action is regulated by the temperature of the water in the cooling system. In warm weather the circulatory system functions the same with the Bishop-Babcock Aquastat as without it—in cold weather it controls the temperature of the water in the circulatory system.

When the flow of water is throttled by the Aquastat, pressure of the water between it and the pump increases, thereby decreasing the power consumed by the pump. If the water were completely shut off, bringing up the pressure to about 15 pounds, the power consumption of the pump would be reduced about two-thirds.

#### Engine warms up quickly

Start your car on a cold winter day—and the Bishop-Babcock Aquastat retards the flow of the water around the combustion chamber until it is thoroughly heated. Then the heat of the water expands the bellows (see diagram) and the heated water is released to travel its course in the circulatory system.

As the water cools, the Aquastat closes. As it becomes heated, it opens. The action is entirely automatic.

No bothering with the choke for a half hour, or an hour, after starting the engine on a cold winter day. In five minutes your car is working as well as on a summer day.

### ANNOUNCING

### the Bishop-Babcock Aquastat

- adjusts the water cooling system to seasonal requirements
- maintains constant temperature in the water surrounding the combustion chamber and cylinders
- -prevents over-cooling of engine in cold weather
- warms up engine quickly in cold weather and reduces use of choke
- -saves fuel by preventing recondensation and by permitting use of less gas
- -reduces carbon deposits from excess fuel
- prevents diluting of oil in crankcase by excess gasoline

The Bishop-Babcock Aquastat secures and maintains a degree of heat in the water around the cylinders which could never be obtained on the coldest days without its use. When the engine stops, cooling is greatly retarded, due to the closing of the valve and the holding of the hot water in the cylinder block.

No excess gas in the combustion chamber to recondense, waste fuel, form carbon, and dilute the lubricating oil. The Bishop-Babcock Aquastat saves fuel, saves oil, saves the engine—and gives you a more efficient car.

#### Installed in 10 minutes

It is easily installed. Just cut out a piece of the hose between the cylinder head and the radiator, clamp the Aquastat to the hose connections, and it is ready for use. This takes only a few minutes.

The Bishop-Babcock Aquastat is manufactured by The Bishop & Babcock Company, who for years have occupied a leading position as manufacturers of thermostatically controlled heating specialties. The principle of the Aquastat is identical with the principle which has been accepted as standard in the operation of thermostatic traps in the heating industry.

For several years The Bishop & Babcock Company has been supplying elements for water control to manufacturers of high-priced automobiles. The experience thus gained, and the extensive engineering, research and manufacturing knowledge which has been acquired in the heating field, have contributed to the development and perfecting of the Bishop-Babcock Aquastat.

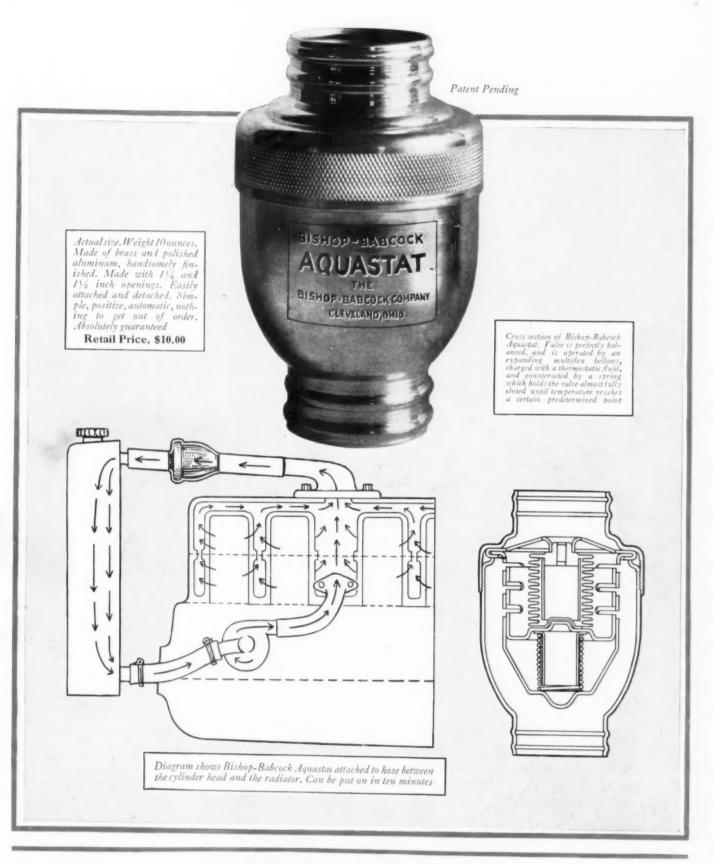
We welcome tests from manufacturers, engineers, dealers and owners. We guarantee satisfaction. Write for details to The Bishop & Babcock Company, Automotive Specialties Division, Cleveland, Ohio.

#### Water temperature in cylinder head

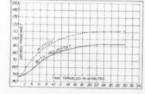


Two identical test runs, with and without the Aquastas, were made on the same day, over the same route, at a very nearly constant speed of 25 miles per hour.

The chart shows clearly two results obtained by the use of the Aquastat: I. Rapid increase in the water temperature at the start. 2. An increase of about 40 degrees in the "running" temperature of the water, even on a day when the mean temperature of the atmosphere was as high as 43 degrees



# Water temperature in bottom of radiator



This chart, made from the same test runs, shows that the Aquastat maintains a temperature of the water in the radiator, just low enough to attain the desired temperature increase in the cylinder head water.

At the same time enough water is admitted through the Aquastat from the very startioc ause a rise in the temperature of the water, even at the bottom of the radiator

# We invite tests of the Bishop-Babcock AQUASTAT on the following automobiles

American
Anderson
Auburn
Buick
Case
Chandler
Chevrolet
Columbia
Crow-Elkhart
Davis
Dodge
Dorris
Elcar
Haynes

Hollier

Hudson
Jackson
Jewett
Jordan
Kissell
Lexington
Locomobile
Marmon
Mercer
Mitchell
Moon
Nash
National
Oakland
Oldsmobile

Packard
Paige
Paterson
Peerless
Pierce-Arrow
Premier
Reo
Roamer
Stearns-Knight
Studebaker
Templar
Velie
Wescott
Wills St. Claire

# Manufacturers

See the Bishop-Babcock Aquastat on exhibition at the Commodore Hotel, New York, in connection with the New York show, and at the Congress Hotel, Chicago, in connection with the Chicago show. Our Engineering Department will gladly co-operate with you in conducting tests to determine the efficiency, economy and serviceability of the Bishop-Babcock Aquastat.

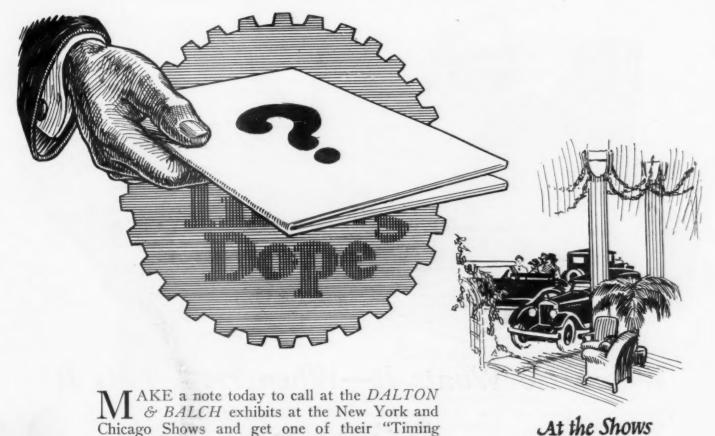
# To the Trade

A really worth-while opportunity is offered you in connection with the Bishop-Babcock Aquastat in your community. Efficient in operation, easy to install and absolutely guaranteed, the Bishop-Babcock Aquastat is proving a big winter seller everywhere. Write for sample, stating make and model of your car (this applies to the trade only), and for details of the Bishop-Babcock Aquastat sales plan.

# Bishop-Babcock\_AOIIASTAT

The Bishop & Babcock Company Automotive Specialties Division

Cleveland, Ohio



Chicago Shows and get one of their "Timing Dope" Charts.

We will be leasted in stage D 128 fourth floor.

We will be located in space D-138, fourth floor, Grand Central Palace, at the New York Show, and space 85 in the Coliseum Gallery at Chicago.

These wall charts contain information compiled for repair and service work on motor timing and other valuable shop information—information that will make these jobs easier to do—quicker—and productive of better profits.

You cannot afford to be without one or more of these charts, or miss the chance to inspect the line of D & B Silent Timing Gears that will be shown. These gears have a countrywide reputation for Accuracy—Durability—Silence—Quality that has made them the preferred gears for replacements. Over a quarter of a million sets are in use.

Be sure and make a note—now—to call for one of these charts.



We will be in space D-138, fourth floor, Grand

Central Palace, at the New York Show, and in

space 85, Coliseum Gal-

lery at Chicago. Come

in and see us!





Where He Wants It-When He Wants It

# Airco IGNITION GAUGE

The Original Ignition Gauge Utilizing Neon

COLD weather is the enemy of good ignition—to be met most successfully by the winter driver who makes frequent use of his Airco Ignition Gauge.

This efficient detector of spark plug and other ignition troubles is now furnished with a nickel-plated clip, designed to be screwed to the dashboard under the hood, within easy reaching distance of the engine. See illustration above.



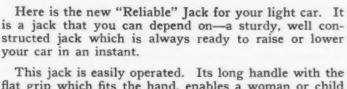
AIR REDUCTION SALES COMPANY

342 Madison Ave., New York, N. Y.

Pioneer in commercializing the elements of the air

TEAR OFF AND MAIL TODA





flat grip which fits the hand, enables a woman or child to lift any load up to 1,500 pounds.

The No. 9 is an improvement in steel jack construction.

A Light Car Jack of

**Exceptional Merit** 

The No. 9 is an improvement in steel jack construction. It is completely reinforced throughout. The rack bar is of steel, with machine cut teeth. Finished in red baked enamel.

Ask to see this jack at your jobber's. He has a complete line of "Reliable" Jacks or will get some for you. All "Reliable" Steel Jacks are painted red. Be sure to ask for the red jack.

The "Reliable" line comprises thirty-five different models ranging in capacity from one to ten tons and covering the entire field of auto truck jacks.

RELIABLE



Warning to Dealers: When you buy Reliable Jacks—be sure you get the product of the Elite Mfg. Co., Ashland, Ohio. The Reliable line is being widely imitated and this notice is given for your protection.

# ELITE MANUFACTURING CO.,

Dept. MA-1

Ashland, Ohio

	_
Elite Mfg. Co., Dept. MA-1, Ashland, Ohio.—Please mail me one of these Jacks. You may bill me through	zł
my regular jobber, whose name is	
Name	
Address	
Town State	

# A Crane Type Wrecker

# By ERNEST HOLMES

Hand or power driven with operator standing on ground

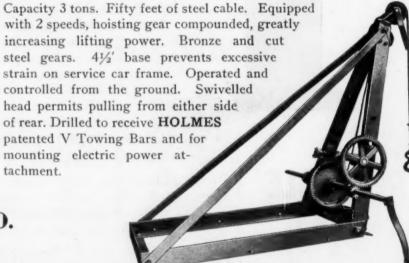
See it at the New York and Chicago Shows

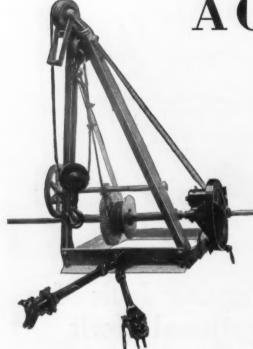
"The amount of towing I can do doesn't warrant the investment. Otherwise I'd buy it in a holy second."

Repairmen have often said that when they badly wanted a **HOLMES** Auto Wrecker. They were right. They kept their feet on the ground, as good business men should.

So we built a Crane Type Wrecker for that sort of man. Being a good business man, he will see instantly that this Wrecker is priced to pay good returns on the small investment. It only costs \$110. The efficiency Ernest Holmes puts into his Wreckers makes them pay even better than is expected.

The Wrecker below is what your \$110.00 buys. Read the brief specifications, then write us or ask your jobber for a list of the fourteen exclusive features embodied in this Wrecker.





The V Towing Bars and electric power attachment are extra. Motor can be attached in ten minutes; is controlled by operator standing on the ground. Price including snatch block \$70.

HOLMES V Towing Bars eliminate any possibility of towed car swinging sideways or jamming into the Wrecker, give perfect control and make possible higher speed with perfect safety while towing. Your accessory jobber will supply you for \$30.

## ERNEST HOLMES CO.

CHATTANOOGA, TENNESSEE



# Read this story of a 4 Day Job reduced to a few hours time

It ordinarily takes about four days to completely dismantle a motor-send the bloc out for cylinder resizing-get it back and reassemble the engine.

The Oldsmobile Service Station in New York hasn't removed an engine bloc in two years-for cylinder resizing. With an Auto-Hone they do in a few hours what it used to take days to do.

This is overwhelming evidence of saving and PROFIT

Every Garage and Service Station can make the same profit. Connect the flexible arm of the Auto-Hone to your electric drill—slip the Auto-Hone into the cylinder—turn on the power—and in fifteen to twenty minutes the four honing stones remove the usual five to seven thousandths out-of-round-all traces of taper — ring travel — unevenness — leaving a clean smooth, polished cylinder surface.

Put aside questions-disputes-curiosity-



to operate the Auto-Hone.

Any mechanic's helper can resize cylinders with it — is so simple and effective.



You only remove a few partsenough to give Auto-Hone access -then you can go right "down the line" on a string of cars.

SOME PROFIT

See Demonstration New York Show Space D197A 4th Floor

See Demonstration Chicago Show Space 74



# PARKER VISES

Grip Like a Grizzly

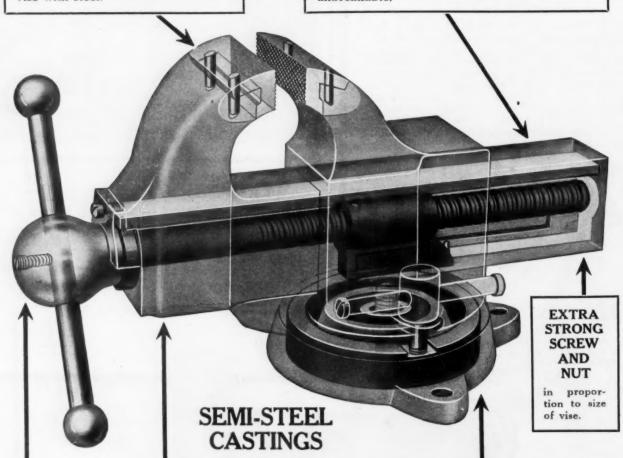


# RENEWABLE TOOL STEEL

Milled to fit; pinned on, not cast or screwed on. Cover entire top of vise with steel.

### SOLID STEEL BAR SLIDE STRENGTHENER

The Parker "Superior" Vises have a solid steel bar cast in the slide, making it practically unbreakable.



### HANDLE "STAYS PUT"

Set screw and spring holds it anywhere you place it.

# IMPROVED SADDLE AND SOLID UNDERPORTION

The slide is further strengthened by an outside collar or saddle. This makes possible a solid underportion in place of the usual hollow casting. The screw can be removed easily.

# A SWIVEL THAT GRIPS LIKE A GRIZZLY

A swivel base with the strength of a solid back jaw. Not a mere clamping device, but a form of construction that gives a gripping power 360 degrees of the base by the expansion of a ring.

JOBBERS AND DEALERS, SEND FOR CATALOG No. 57-T
THE CHARLES PARKER CO., Master Vise Makers
MERIDEN, CONN., U. S. A.

# THE WORLD'S STANDARD REPLACEMENT TIMING GEAR

THE accredited standing of Perfection Gears as "The World's Standard Replacement Timing Gear" speaks eloquently of accomplishment. Their endurance is substantially evidenced by records of 30,000 and 50,000 miles of quiet, unmurmuring service. The stamina of a non-metallic material that outwears metal and the precise accuracy of the specialists who make them, contribute the prime qualities of Silence and Durability.

Let us send you the name of your nearest Perfection Jobber





PERFECTION GEAR COMPANY, 1475 MICHIGAN AVENUE · · CHICAGO



# OAKES Spare LOCK

# Protection—Plus Neatness

The Oakes Spare Tire Lock not only prevents anyone stealing the spare tire or rim, but also adds a touch of beauty and neatness to the car.

This lock eliminates all the ugly, rattling "makeshifts," such as chains, straps, wire ropes, padlocks, etc. It is neat in design, sturdily made, and fully dependable. Replaces the rim wedge on the carrier, and is easy for the car owner to put on or take off. Made in types to fit nearly all cars. Eight million motorists need it. It "dresses up" any car. Lock housing is glossy black enamel—lock face is nickel-plated.

Car and accessory dealers are making splendid profits on this lock. Car owners want it when they see it. You, too, can make money selling it. Write for trade discounts, or see us at New York or Chicago Shows.



Above: Oakes Spare Tire Lock type B, fits many popular makes of cars. Price \$5.00. Ford type \$4.00.

At Right: Type M Lock, fits tire carriers made for one or two tires. Price



# OAKES Spare LOCK

# Prevents Theft-Adds Beauty

With over two million cars using disc wheels, there's a great demand for this attractive, reliable lock. It gives full protection against spare wheel thieves, and adds beauty and distinction to the car. Several car makers are using it as standard equipment. Thousands of car owners want it. You can make some real profits selling this lock.

It is made in types for almost every car carrying a spare disc wheel. It fits over the locking stud of the carrier—is easy to install and operate. It replaces flimsy, noisy padlocks, does not rattle, and is an asset to any car. Two popular types, which fit off-center locking studs on wheel carriers, are shown here. They have glossy black lock housings and nickel-plated lock faces. Another type for center locking studs, has nickel-plated housing and lock face. Ask for trade prices.





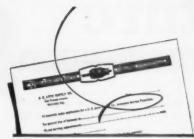
Above: Oakes Spare Wheel Lock type R, fits on the off-center locking stud on wheel carrier. Price \$5.00.

At Left: Type L Lock, fits Budd Disc Wheels, now used on Dodge and other cars. Price \$5.00.

See All Oakes Products at the New York and Chicago Shows.

The OAKES Company, Established 1910, Indianapolis, U. S. A.

# Armature Service Offers a Rich Field to Distributors



From a distributor's standpoint armature service is divided into three parts—the market, the investment, and the turnover of capital. Here are some facts that are based on our years of experience in this business.

The huge demand for armature service of the right kind is indicated by the fact that during 1922 our capacity for rewinding armatures was taxed at all times. The demand has been increasing steadily, so much in fact that we have had to increase our facilities. Dealers and repairmen now realize that armature rewinding, when done properly, is a sound, practical proposition.

To take care of your territory a surprisingly small investment is required. In the average case a few hundred dollars' working capital is all that is required. The investment is always represented by tangible merchandise which can be liquidated at any time.

Ordinarily there is a complete turnover of capital several times a year. Any business man knows that frequent turnover of capital is essential to success. This fact, then, is a highly important one.

For men or concerns who are in position to act as territorial distributors we have an attractive and highly profitable proposition. Our distributors maintain stocks of rewound armatures so they can supply the trade in their territories with immediate exchange service. Our discount terms enable our distributors to sell armature service at the same prices we advertise nationally.

Full details of our distributor franchise will be sent to you upon request.

# Look for the Yellow Band Every armature rewound by us carries this band on which is printed our positive guarantee that the armature will give the same service as a new one.

### PRICES

Ford armature rewound......\$2.00
Any two unit generator armature rewound ................................\$5.00

Dealers and Repairmen—Send in your defective armatures and guaranteed rewound ones will be shipped from our exchange stock.

# U. S. AUTO SUPPLY COMPANY

ARMATURE SERVICE DIVISION

3845 South Wabash Avenue

Chicago





IS MADE A SPECIALTY-"





## Snap-On Wrenches for Chevrolets, Only 14c Each!

Thirty-six wrenches to work with, but only three to carry! This is Snap-On "Chevrolet-Set"—selling retail at a price figuring a fraction under 14c apiece for a single socket wrench. Easy sales—just as easy as with 17 other owner selections for these other cars:

Ford
Buick
Cadillac
Chandler
Dodge
Essex
Hupmobile
Hudson

Maxwell
Nash
Oakland
Oldsmobile
Overland
Paige
Reo
Studebaker
(Light Six)



# Why Did "Stan" Draw this Picture

This cartoon is one of an extremely popular feature series which has been appearing in hundreds of daily and weekly newspapers throughout the country. (Reproduced by courtesy of NEA Syndicate Service, Inc., Cleveland, O.)

OU laugh—with millions of others.

"Stan"—cartoonist—knew you would.

Why?

Because you know how helpless these two fellows are. Doggone it, you've been in this picture yourself, haven't you? And you laugh, like all of us, in seeing this common "wrench" disease visited onto another!

Laugh your head off—but let the cash register play the accompaniment. Here's the dope: Stock Snap-Ons and sell 'em to car-owners by the "set." Our engineering department has made a study of the most popular cars—adapting Snap-Ons to each one. No "misfits." No prohibitive price. Just an easy selling proposition which requires only a small investment and nets a fat profit.

DISPLAY BOARD FREE! A salesman in itself. Holds one each of every Snap-On unit. Furnished with booklet giving complete Snap-On adaptations and selections for 18 most popular cars. Write today for full details.

Motor Tool Specialty Co., Distrs.,

Dept. A-14,

Milwaukee.

14 E. Jackson Blvd., Chicago, Ill.

Snap-On Wrench Co., Mfrs.,

Wisconsin

Snap-on

Socket Wrenches





# It "Barks" when Your Car Is Touched



Your car—the thief has "spotted" it. What an easy job! What matters if it is locked? Nobody in sight just a moment's work, then-. The thief lays a hand on the machine. Instantly, a terrifying screech splits the air. Police, blocks away, must have heard that warning sound! Footsteps approach—lights flash—the game is

And your car has been saved from theft through the never-ceasing vigilance of VIBRALARM—the "electric

# 100% Protection

VIBRALARM is a sensitive vibrating mechanism—attached SECRETLY to any metal part of the car. Simply turn the secret switch, and the "watchog" is on guard. At the touch of anyone who does not know the secret of the switch, the watchdog raises the alarm. The alarm continues as long as the car is molested.

### Better Than Locks

VIBRALARM protects your car as locks cannot. The car thief is a specialist on locks. But no thief, no matter how clever, can tamper with a VIBRALARM-equipped car without rousing the noisy "watchdog."

### Protects Accessories

Most insurance companies decline to insure accessories because ordinary locks fail to protect against theft. But, when VIBRALARM is "set" it is impossible to remove ANY accessory without the theft being instantly exposed. As a protector of accessories alone, VIBRALARM is worth many times its small cost.

### Protects Private Garages

VIBRALARM can easily be set to prevent entrance of thieves into your garage. The slightest movement of the door or windows sets off the alarm. Night or day, VIBRALARM is 100 per cent protection against theft of either your car or accessories.

Motorists everywhere are using VIBRALARM protection in addition to ordinary looks. Put one on your car and make it safe. VIBRALARM costs only 37.50 complete. Easily installed in a few minutes. Absolutely guaranteed. If your dealer can't supply you, write us today for address of nearest VIBRALARM dealer.

# The Industrial Sales Company Kansas City, Mo.



### New Territory!

Profitable VIBRALARM territory is now sen on a state-wide distribution basis. We see an unusual proposition to offer men capace of handling EXCLUSIVE county or state stribution, and who want to expand with fast growing business.



# Are You Overlooking This Big Source of Business—replacing dried out

tire pumps with dependable MONROE SELF OILERS?

There's a lot of people who come into your store, in need of a new tire pump. Ten to one the pumps they have in their cars are dried out and useless. These are the folks to whom you can sell MONROE SELF OILERS. The MONROE is a pump they can depend upon in any emergency. No need to worry about this pump EVER drying out. The patented self-oiling feature makes that impossible. And this is but one MONROE advantage. There are many more. Though it sells at a lower figure than most pumps, each sale brings in a large and substantial profit. Stock up, as other dealers are doing, and cash in on this big demand. Full details and prices upon request.

Monroe Auto Equipment Manufacturing Co.

Monroe Michigan

Sales Representative to Jobbers Only
The Fulton Company

Milwaukee, Wis.

MONROE CLOSED CAR SPOT-LIGHT BRACKET

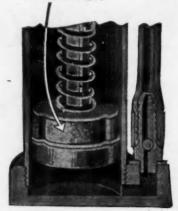
A new Spotlight Bracket for closed cars that thousands of motorists have been waiting for. Will fit practically any spotlight on the market. A big winter seller that brings a neat profit.

MONROE BRAKE SHOE FOR FORDS

Insures uniform and even braking for every Ford car. Simple and strong-Easily and quickly installed—no special tools required. You'll find this shoe a snappy business booster among Ford owners.



PATENTED SELF OILING WASHER



The patented MONROE Self-Oiling Washer is the secret of MONROE dependability—a feature of ne other pump. Keeps the valve leather soft and pliant always. On ordinary pumps, having no permanent means of lubrication, the valve leather soon dries out and cracks, rendering the augus worthers in time of need.

MONROE Self-Oiling TIRE PUMP

# ter Hundreds of Thousands in Stock To Replenish Your Bins

WHETHER your inventory records show a shortage in one or a hundred dif-ferent types of bushings or bearings, the matter of service is a greater factor to you right now than at any other time during the year.

Following inventory time thousands of bins must be replenished, preferably from stocks on hand—bushings and bearings for every make of motor car, truck,

tractor, motorcycle, aeroplane and power-driven machine.

Hundreds of thousands of bushings and bearings will be required — on short notice.

Every Type—Every Size—For Every Purpose Contrary to a somewhat general manufacturing policy of depleting stocks before inventory, we have put through our great group of plants, stock orders for hundreds of thousands of bushings and bearings of every type, every size and every automotive and machinery requirement—huge stocks of even those special bushings ordinarily manufactured only to special order — bushings ranging in weight from less than one ounce to one ton.

### Every Bushing or Bearing of Virgin Metal

Only virgin metal is used in Johnson Bronze Bushings and Bearings, and each

is subjected to numerous rigid inspections, both metallurgical and mechanical. Every bushing and bearing is machined to limits in fractions of a thousandth, and all automotive products conform strictly to S. A. E. specifications.

### Small Quantity Orders at Large Quantity Prices

Through the economy effected by putting enormous stock orders through our factories, we are enabled to quote you minimum prices on standard quality bushings and bearings.

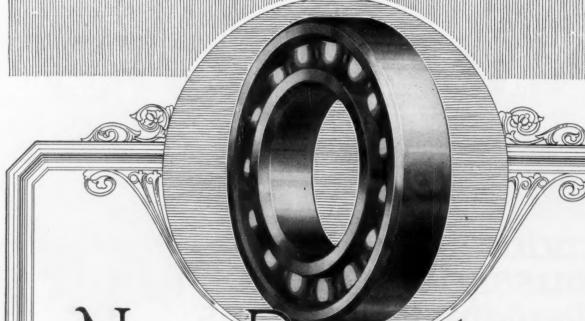
We do not propose to compete with scrap metal or yellow brass products, but if you insist upon a virgin metal product, efficiently machined to standard specifications, we can effect you a real economy in your buying.

Regardless of quantity or variety of your order, if you want service and satisfaction, write, phone or wire us for our stock list of bushings and bearings.

# JOHNSON BRONZE COMPANY NEW CASTLE, PA.



BRONZE BUSHINGS AND BABBITT LINED BEARINGS



# New Departure Ball Bearings

# The Silent Partners in Every Car

As you stroll down the aisles at the Shows this season, you may not see much to remind you of the New Departure Ball Bearing, yet it is there in every car, almost without exception.

That fact seems to be taken for granted by the manufacturer, dealer, and public.

They do their duty so quietly, so well that one is apt to forget them in attending to accessories which frequently demand your attention.

Because they do not wear and, therefore, do not need adjustment, they are chosen by manufacturers—even though they do cost more to make or buy than other types.

Ask about the new front wheel type New Departure which is now replacing case-hardened and adjustable bearings in many cars.

# THE NEW DEPARTURE MANUFACTURING COMPANY

Bristol, Connecticut

Detroit

Chicago





HOW much gas left in tank?"—The Lee Day-Night Gasoline Gauge tells you—instantly and accurately—in the daytime or on a pitch-black night. No fumbling for matches, no guesswork. A glance at the Lee Gauge in the daytime, or a touch of the fingers upon its face at night and you have an accurate reading—ALWAYS. The shape of the humps tells the story—a principle of gasoline indicating that has won the instant approval of every Chevrolet dealer and owner who has seen it.

Amount of Gas in Tank

Beautifully finished in polished aluminum—sturdy, simple and trouble proof—the LEE DAY-NIGHT GAUGE is built for lifetime service. Fits all 1923 490 models and 1922 closed cars. To install, merely insert in the filling hole in place of present tank cap. Price complete \$2.00.

Chevrolet Dealers—You'll find this item one of the quickest selling and most profitable small accessories you have ever handled. Hundreds have already been placed. How about your territory? See your jobber today or write us direct.

### TO FORD DEALERS

The LEE DAY - NIGHT GAUGE for Fords is one accessory that MOVES. Eliminates the bother of taking out the seat and using a stick. The driver merely reaches his hand under seat, touches the face of the gauge and knows instantly how much gas is in tank. Ford gauges for any size tank.

\$1.50

To install just screw the gauge in place of the present tank cap. Quick sales—good profits. See your jobber or write us at once.

# The Columbus Company

Dept. A-314 East Broad St.

Columbus, Ohio

Pacific Coast Distributors

The Alden-Glaze Company, 143 2nd Street, San Francisco, Cal.

# EVERY MOTORIST KNOWS THIS LINE

The Kokomo Electric line has been on the market for twenty years. Every motorist knows the line for the correctness of design, the staunchness of construction and the all-around dependableness of every item. Dealers everywhere find Kokomo Electric Company products their best and steadiest sellers.

# The Kingston Heater



The Kingston Heater is the fastest selling device in its class in the country today. It has received the warmest approval, and dealers are swamped with business. It is not a makeshift, but a staunchly built heating device, an ornament as well as a winter necessity. Made in the following models, boxed, ready to install:

Ford, \$3.75 Overland, \$5.00 Dodge, 5.00 Chevrolet, 5.00

# The Kingston Battery Ignition System for Fords

A high-class ignition system similar to that used on the highest priced cars. Completely wipes out all commutator trouble resultant from dirty contacts and uneven wear, and obviates annoyance from loose oilsoaked wires, or wires with raveled insulation. Strictly high-class, fully guaranteed, easily installed.

Price, complete, \$20.00

# The Handy Carburetor Adjuster



Another great cool weather seller. With pull button installed on steering column, just under the steering wheel, a full one-third turn of the carburetor needle may be made. Easily installed, nothing to get out of order, and will actually save its cost in gasoline in a short time. Makes cold weather starting and driving easy.

Price Complete, \$1.50

# KOKOMO ELECTRIC COMPANY, Kokomo, Ind.

BRANCHES:
NEW YORK: 245 W. 55th St.

BOSTON: 15 Jersey St.

CHICAGO: 1430 Michigan Ave.

SAN FRANCISCO: 32 Van Ness Ave.

# MINGSTON

# THE UNICO NEWS

Published every other week by the UNICO MOTOR PRODUCTS CORP.

VOL. 1. No. 1.

THURSDAY, JAN. 4, 1923

Price: Three Minutes

# **DOLLAR RING FOR FIFTY CENTS**

# Maker Applies Improved Processes with Pleasing Result

### Shop Profits Increase Seen

St. Louis, Jan. 4. — The UNICO Motor Products Corporation of this city, by new ideas in manufacturing practice, have produced piston rings of the quality usually retailed at one dollar, but which are marketed at the flat price of fifty cents for all models.

Experts predict these rings will be eagerly taken by garagemen who try to give customers full value, while making maximum shop profits. They base their prediction upon the successful performance of *UNICO* rings and reports of extra gains by repairmen who have installed them.

### "Skin" Adds Elasticity

Individually cast rings have the "spring" to maintain steady pressure against cylinder walls. UNICO rings are individually cast. When the hot metal touches the damp sand a chilled "skin" is formed on the iron. The particles of iron in this "skin" are under high tension. This is mainly the cause of springiness. Full advantage of it is taken in the UNICO ring by leaving most of this "skin" on the inner surface.

All other surfaces are machined within a one-half thousandth of an inch of the required dimensions. This is specially important on the upper and lower surfaces because a "sliding" fit in the groove is essential. In this feature UNICO rings excel. This saves time when installing, for seldom, if ever, need a UNICO ring be ADVERTISEMENT

rubbed down on emery cloth.

### Improved Slotting

Great stresses are set up in a ring when being slotted. These must be neutralized, or the ring is apt to "spiral" in service, which permits leakage. It is customary to slot half way, then turn the ring and slot the rest of the way. By the UNICO method the slotting stresses are directly opposed to one another, and so neutralize each other.

### "Short Group" Turning

Economical production requires that a large number of rings be put through the same process at the same This frequently is ne. When a great time. overdone. number of rings are clamped together tight enough to prevent slipping under the tool, distortion may begin. When the tool strikes this irregularity, either too much or too little metal may be removed. The ring may then have a thin or thick spot, and spring unequally.

This is prevented in UNI-CO rings by machining outer surfaces in shallower and shorter cuts. In place of forty or fifty rings at one time, not more than twenty are machined. Less compression is required to hold them, so none is thrown off center. Absolute uniformity results.

a "sliding" fit in the se essential. In this UNICO rings excel. wes time when infor seldom, if ever, UNICO ring be Is this expensive? No. The speedier cut saves some of the time. The fewer rejects more than offset the rest. The result of these improvements is to decrease

the cost of *UNICO* rings while improving their quality.

### Jobbers Expect Increased Turnover

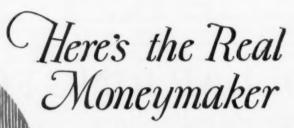
St. Louis, Jan. 4.—(Special Correspondence.) — Steady improvement in the quality of automobile replacements, with declining prices, and greater pressure by the Automotive Equipment Association to increase shop work this winter, are making jobbers optimistic about the business to be done.

High among the products looked to bring about increased prosperity stands the line of piston rings exten-

sively advertised by the UNICO Motors Corporation of St. Louis. These piston rings have been widely accepted by dealers, who generally turn their stocks in a few weeks, and reorder in increasing quantities.

The flat price of these rings is proving an excellent sales-stimulant, as it makes for a wider margin of profit on fast-moving sizes, and calls for smaller investment in slower numbers. Likewise it simplifies accounting. The standard discounts are allowed, which, with the extraordinary turnover, make for a large net profit showing.





WHAT'S wanted sells. Monogram Junior is made in response to insistent demands.

It repeats like a machine gun. That's why it's the real moneymaker.

Ask your Monogram distributor. Ask now.

GENERAL AUTOMOTIVE CORPORATION 625 West Jackson Boulevard Chicago, Illinois

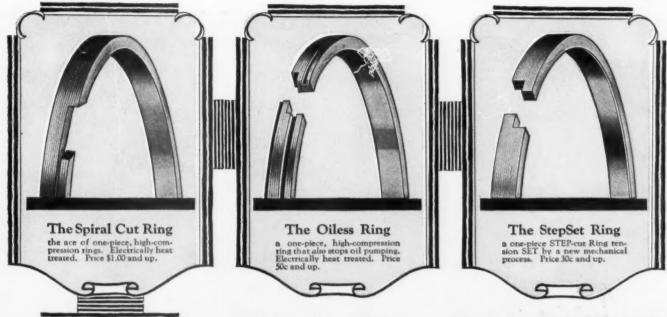
See It At the Shows

# MONOGRAM

Self Locking Radiator Cap

For Ford, Chevrolet 490, Overland, Star and Gray





# Stock This COMPLETE Piston Service Line

Here is a wonderful opportunity for you to establish a profitable, *complete* Piston Service Station in your town! Inland now offers a full Piston Service Line—a superior Ring for every purpose and price, and a complete series of high-quality Replacement Pistons and Piston Pins.

Go after the big market for Inland Piston Products—there is a rich, steady harvest of profits awaiting you if you start now to build a solid business on this complete, high-quality line.

TRADE MARK

REG U.S PAT OFF.

# Investigate Now!

Dealers, Auto Parts Companies, Reborers, Regrinders and Repairmen—this message means money to you! If you carry only part of the Inland line, round it out and increase your profits. If you want to stock this better and complete line, talk to an Inland jobber—in case you do not know his name, write us direct.

Our new booklet, "The Story with a Ring to It," tells the story of each of these celebrated Inland Products. Send for your copy now.

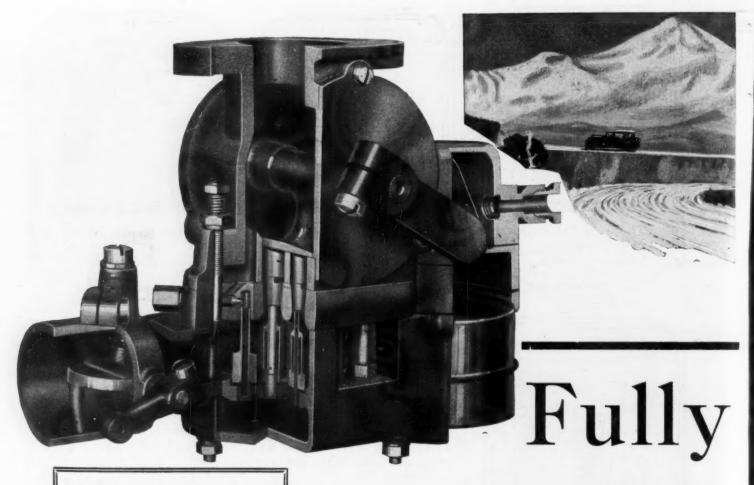
### INLAND PRODUCTS COMPANY, INC.

Branches and Stocks in Principal Cities
Main Office and Factory: St. Louis, U. S. A.









## Making Good on the Highest Class of Cars

We have many enthusiastic testimonials from owners of Locomobiles, Cunninghams, Pierce-Arrows—many of them famous men, good judges of mechanical efficiency — from Maine to California.

The following attributes have gained their praise:

- 1. Simplicity—no springs, tensions or adjustments.
- Efficient in all altitudes, and in all weathers, winter and summer.
- 3. Extraordinary Efficiency at low speeds.
- 4. No matter how weak the engine's suction, only fully vaporized gasoline enters mixing chamber.
- Simple float chamber—no counterweights.
- Only 4 nuts to loosen for whole bottom portion to be removed for cleaning.
- 7. An instantaneous response to the throttle at all speeds.

The OMAC Carburetor is simple.

But it makes a remarkable difference—even on the highest-priced cars.

Quality built—it matches the finest engine assembly.

Of universally applicable design—it fits the needs of all occasions.

Reaching its highest efficiency at Low Speeds—it gives supreme service just at the point where 90% of all engines are used the most.

THE JENNINGS
404 No. Richland Stre
PITTSBU



# Vaporized Fuel—under all conditions

Its peculiarly original make-up (12 complete carburetors in one!) makes it seem complicated. But the very reverse is the fact.

It can be taken apart and reassembled in five minutes.

No springs, tensions, or trick devices. And only one adjustment—on the *idling* unit.

Easily the most interesting and remarkable carburetion device as yet introduced. See it at the Shows.

# JOBBERS — DEALERS MANUFACTURERS

See the OMAC at the SHOWS

New York . . . . Space C-6A

Chicago . . . . . . Space 39

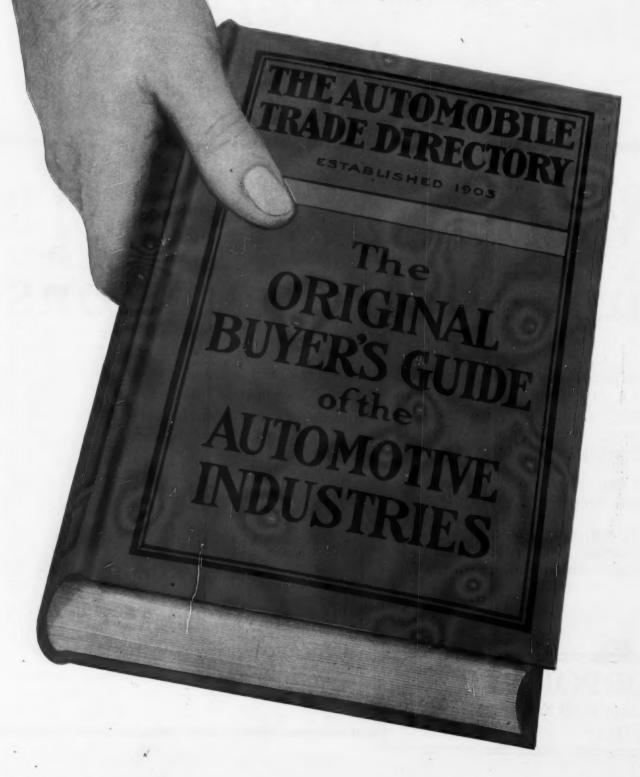
Coliseum Basement

# **CORPORATION**

et, Homewood Station RGH, PA.

# Use the Red Directory!

Use the Red Directory as your buying guide. It is convenient and complete. For your benefit, many manufacturers have provided a condensed catalog of their products and information regarding their nearest sources of supply. Quick reference information of this sort enables you to order and receive your goods without delay.





# Show'EmandThey'llBuy

A Circle "S" Windshield Cleaner





Every Car Owner wants an Automatic Windshield Cleaner that will not fail at the critical moment, that is absolutely trouble proof, that never gets out of order, that is powerful enough to thoroughly clean the glass and last but not least sells at a price he is willing to pay—Such is the Circle "S."

No vanes, pistons, rods, cylinders or cams enter its construction— No packing to dry out—No friction producing parts to use up power. Squeegee operated by means of 2 simple vacuum cups, an ordinary rack and pinion—There is absolutely nothing to get out of order.

All adjustments made from inside the car. Pressure of squeegee against the glass may be varied or entirely released. Can be operated by hand from inside the car should heavy snow or sleet deposit on the glass while standing.

The selling price is Five Dollars—Little more than is asked for a good hand cleaner.

Dealers and Jobbers-Write today for Sales possibilities



F. W. STEWART MFG. CORP.

349 W. Austin Ave.

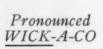
Chicago, Illinois



# AT THE SHOW-

New York **SPACE** D-177





# Be Sure to See:

The Wandering Oil Groove The Twin Cut The Wicaco Individual Cast

They'll all be on hand—at the Wicaco booth.

The Wandering Oil Groove will show you how Wicaco avoids oil extremes and provides a happy middle course between friction and carbon by permitting "just enough oil."

The Twin Cut will demonstrate how it holds compression powerless to escape. When expansion forces the diagonal, its horizontal cut locks tight.

Three other features of design, individual cast, concentric shape and one-piece construction — will prove maximum piston ring efficiency.

And we've got an especially interest-ing piston ring merchandising plan

to show you. A new quantity of rings in every box has startling merchandising advantages, special selling helps, display material, an advanced Zone Distribution Plan for Jobbers, a—but wait until you get there, when we can go more into details.

In case you can't come, write us and we'll send you the story.

WICACO SCREW & MACHINE WORKS, INC.

4801 Stenton Ave.

Philadelphia, Pa.



# When Springs Break put on



VULCAN and safeguard your reputation and your customers' satisfaction. The extreme care exercised in the making and testing of each spring that bears the Vulcan trademark is an asset now almost universally recognized and prized by the most progressive garagemen and dealers in America.

The better quality built into each Vulcan Spring has made possible nationwide distribution—"In Every Town for Every Car."

JENKINS VULCAN SPRING CO., RICHMOND, IND.

Boston

Dallas

St Louis

San Francisco

Portland

Seattle

Ask Your Jobber for

SPACES On Every Spring

# Explaining the Short Turning Radius and Easy Steering of the Nash Six

Requests for explanations of the unusual responsiveness of the Nash Six to its wheel are so frequent that many Nash dealers regard the pressure gauge shown to the right as an indispensable piece of sales equipment.

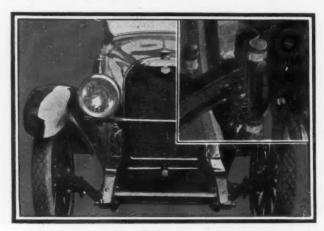
The first reason for the short-turning radius and easy steering of the Nash Six is, of course, the new steering mechanism; the second is the new method of lubricating knuckles and tie rods with Oil-Kipps.

By merely pumping an Oil-Kipp with the palm of the hand, over 1000 pounds of pressure can be developed. This high pressure insures a uniform and complete spread of oil *all around* the bearing surfaces.

The resulting quick, trouble-free and copius lubrication enables the new steering mechanism to do its best and to do it all the time.

### Tested for eighteen months

The Nash organization long ago decided that oil was the only thing that could succeed where grease had always failed.



New, improved aluminum Oil-Kipps are standard equipment on the steering knuckles and tie rods of the Nash Six. Over 1200 founds of pressure can be developed in these Oil-Kipps by merely pumping them with the palm of the hand; almost unlimited pressure is available for clogged bearings.

To them the problem soon narrowed down to this: What is the right device for lubricating tie-rods and steering-knuckles with oil?

After eighteen months they were all agreed that there was one clearly satisfactory solution for their problem.

That solution is the Oil-Kipp.

### How Oil-Kipps work

Each Oil-Kipp consists of a complete pumping unit contained in a die-cast aluminum cup carrying several months' supply of heavy oil. No gun or auxiliary pressure booster is necessary.

They are operated by merely pumping the spring plungers or pistons.



This gauge demonstrates how Oil-Kipps, by building up pressures of a thousand pounds and over, force oil entirely around the bearings of the steering gear of the Nash Six.

Their success in forcing heavy oil all around tight-fitting bearings is due to a simple hydraulic principle.

The outstroke of the plunger creates a vacuum in the barrel, so that oil is sucked into it from the cup.

The instroke of the plunger puts this oil under pressure, because the plunger is so small in diameter that each pound of pressure exerted on the handle means a great many pounds in the pump.

### What Nash Dealers are doing with them

With them, tie rods and steering knuckles can be lubricated in one minute, even by a woman.

Because of the size of the new Oil-Kipps, they carry enough oil for several months. They can be easily refilled with an oil can containing heavy oil.

Nash dealers who have seen the equipment are so pleased with its appeal to women drivers that many are ordering Oil-Kipps to be put on older cars.

A set of Oil-Kipps can be installed on the steering gear in twenty minutes.

A number of Nash distributors are already carrying stocks of them and orders from others are coming in.

Where distributors have not yet received their stock, we can arrange direct shipments. We can also supply the pressure gauge shown above. When writing, please give the name of your distributor.

# MADISON-KIPP CORP., MADISON, WIS.

Nolan Smith & Co., Sydney, Australia. Wm. Couthard & Co., Ltd., Carlisle, England



Oil-Kipps



MAKE STEERING EASY



A McQuay-Norris

Service Stock will materially

increase your profits

If there isn't a service stock of McQuay-Norris Piston Rings, Pistons and Pins in your town, there's an opportunity open to become local headquarters for replacements of these three vital units.

With a McQuay-Norris Service Stock you can give a prompt and complete service to cylinder regrinders and reborers, to garage and repairmen, and to car owners. This will materially increase your turn-over and profits.

It will pay you to investigate this matter at once. If there isn't such a stock in your town, ask your jobber's salesman to tell you how one may be secured, or write our Department M. McQuay-Norris Manufacturing Company

General Offices, St. Louis, U. S. A.
Connersville, Indiana Toronto, Canada

# McQUAY-NORRIS PISTON RINGS PISTONS PINS

FOR AUTOMOBILES, MOTOR TRUCKS, TRACTORS, STATIONARY GAS, OIL AND STEAM ENGINES, MOTOR BOATS, MOTOR CYCLES, AIRPLANES, COMPRESSORS, PUMPS, LOCOMOTIVES, STEAMSHIPS, REFRIGERATING MACHINES.

McQuay-Norris Wainwright Pistons and Pins—gray iron pistons as light in weight as safety permits—specially designed for replacements—available in standard sizes and over-sizes—also in semifinished form 75-thousandths oversize. Pins of exceptional accuracy. Made of special heat-treated steel.

EAK-ROOF sive two-piece design means equal cylinder-wall pressure at all points. Its greater flex-ibility means better performance in worn cylinders. Best for all grooves except top, which should have superout. Made of Electric Iron. Each ring packed in a parchment container. Price per ring—

Supercy — stops oil trouble. Keeps lubricating oil out of combustion chamber. Collects excess oil on each down stroke of piston and empties on each up stroke, which ordinary grooved rings cannot do. Made of Electric Iron. Each ring packed in a parchment container. Price per ring—

JIFFY-GRIP—the quickseating ring with the nonbutting joint. "Seats in a Jiffy." Can be fitted closer than the ordinary step-cut rings. Ends cannot butt when fitted tightly as quick-seating rings should be. Accurately made of Electric Iron. Each ring packed in glassine envelope. Price per ringSnap Rings — of the highest grade. Raised above the average by McQuay-Norris manufacturing methods. Made of Electric Iron. Their use insures all the satisfaction possible for you to get from a plain snap ring. Packed twelve to the carton and rolled in waxed paper. Price per ring —

Pistons and Pins of quality



\$ 1 00 In Canada, \$1.25 50c In Canada, 50c 25c In Canada, 30



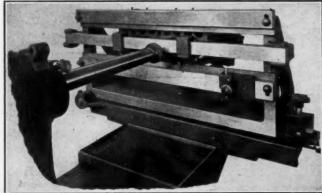


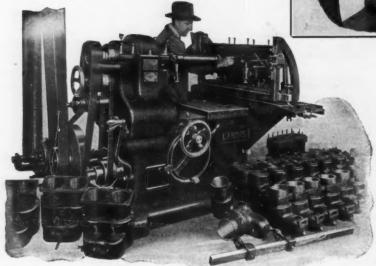






Showing how the Landis Centering Bar locates the cylinder bloc on the Fixture in true alignment with the Spindle.





# More Blocs in a day—

# No Time Wasted in the Set-up Why the Landis is Quicker

Be sure you choose a cylinder grinder well suited to repairshop use.

Unless setting-up time can be reduced to minutes, there is sure to be unnecessary waste of time in changing from one job to the next.

No two cylinder blocs of the same size—a Ford and a Maxwell this morning, a Buick or Cadillac this afternoon, to-morrow some other kind.

The Landis Centering Bar adjusted to a cylinder bloc. This is done before the casting is put on the machine.

Each Landis has a great setting-up time-saving device—the Landis Work Centering Bar. The pictures on this page explain how it works.

With cylinder blocs of all kinds and sizes coming into a shop to be re-ground this device is a wonderful help. It saves as much set-up time as the Landis Grinder saves grinding time.

We know the conditions, and you will find the Landis Cylinder Grinding Machine is equipped to meet them.

Don't select your new grinding machine until you actually see a Landis. There is one in your vicinity. Let us tell you where.

LANDIS

LANDIS TOOL COMPANY, Waynesboro, Penna.

New York Office-51 Chambers St.

# In 30 Seconds!

# the old tire is off and a new one on

Hardly any effort. No tools. No wrenching. No hammering. No possible way of "pinching" the inner tube. This Rim has passed every engineering test. It is mechanically perfect, eminently practical and conforms to standards adopted by the Tire & Rim Association.

ciation. It consists of 3 segments, connected by articulated joints (no hinges). Simple, sturdy, they move easily under the most adverse conditions. Nothing to break, loosen, rattle or make trouble.

As strong and durable as the best of other rims—in respect of tire changing it has tremendous advantages over them all.

all.

And—with all its added value—it costs no more than good ordinary rims.

RIGHT NOW — wideawake dealers, garage and repairmen, are taking it on and getting the cream of the initial impetus of this brand new, distinctly valuable improvement.

# See It At The SHOWS!

New York Grand Central Palace Space D-170 4th Floor

Chicago
First Regiment Armory
(adjoining the Collseum)
Space 32, Gallery



The National Collapsible Rim

# At the New York Automobile Show



we will exhibit for the first time our

# New Six-Cylinder R&V Knight

upon which we have spent an honest and earnest endeavor to make it, taken as a whole, and for broad general use

# The best all-around automobile America has ever seen

In this effort, we have had the benefit of 25 years' experience in building internal combustion gasoline engines; 18 years' experience as automobile builders; eight years as builders of Knight-type engines and Knight-motored automobiles and all the experience gained during the last four years as builders of

# America's ONLY Knight Six

This product is worthy of the attention of both dealers and individual users.

R&V MOTOR COMPANY

East Moline, Ill.

# ReVKnight

"EVERLASTING PERFORMANCE"



# The Only Spring Guaranteed Forever Against Center Breakage

# —the common cause of Spring Replacement

Nine out of ten springs break at the center. Breakage occurs most frequently at that point because there the ordinary spring is weakest—yet there it receives its hardest shocks and blows.

Titanic is the only spring built scientifically correct without a weakened center. No punching of holes or nibs to weaken the spring. You won't have to argue this big advantage of the Titanic to the prospect that comes for a spring replacement. His experience will sell him. In riding qualities Titanic strength and security create a new standard of comfort.

For complete information write your nearest distributor—listed in Chilton's.



**TUTHILL SPRING COMPANY** 

Established 1880

760 Polk St., Chicago, Ill.



# Discount

How Empire Has Removed This Evil To Make Your Profits Free and Clear

The dealer who has scraped to earn his 5% "for cash" often finds that this expected profit has been eaten up by tax and freight charges. Empire Tires are sold to you Tax and Freight

# Paid—a vast advantage, which is set forth in EMPIRE PROFIT POINTER

No. 4. Tax and Freight Paid

Glowing discounts become insignificant when wiped out to a great extent by tax and freight charges. That the dealer may have his full profit, Empire Tires are offered Tax Paid-F.O.B.—Destination.

### SOMETHING TO BE SERIOUSLY CONSIDERED

when you buy tires. Yet it is only one of the features of the new Empire dealers' proposition. We invite comparison in appearance, size, weight, endurance and profit to the dealer.

Write Today, Dept. EA-20



Empire Tire & Rubber Corporation

**Empire** 

Cord Tires

Wear Longest"

*impire* 

Peerless

Red Tubes

Best in any case"

FACTORIES TRENTON. N.J. U.S.A. MAIN OFFICES



# The AUBURN

New Models of Surpassing Appeal to the Motorist Including a Smaller Six at a New Low Price for AUBURN Quality





# Here is Big Money for 1923

GREAT new market is opened for cars of Auburn quality in 1923 by the Smaller Auburn Six which will sell at a price lower than any car of equal value ever produced by Auburn.

In addition, the Standard Auburn cars will be the finest during the twenty-three years' history of the Company. Refinements of body design have increased the grace and appeal to the eye; there is greater comfort, greater convenience in handling and greater sturdiness in the chassis.

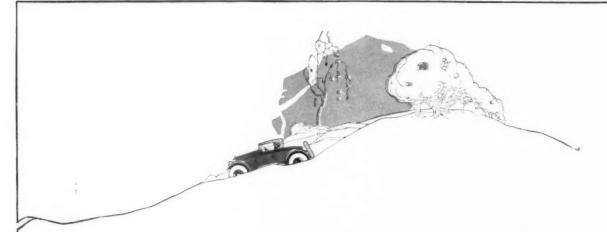
The Auburn is, this year, a car that will attract attention everywhere and advertise itself through its most striking appearance.

There is not a handsomer or more salable car made than the new touring car with the permanent top. It's a wonder from the dealer's point of view.

The Brougham, the Sedan, the Sport, the Roadster, complete a line that is remarkable for good looks and telling appeal to the buyer who wants more than just transportation and takes pride in the car he drives.

Auburn "has something" mighty big and important for every dealer and distributor this year. A line that will be a sure money-maker.





# One of the Strongest Companies

F sixty cars that were exhibited in Chicago in 1903—twenty years ago—the first show in which Auburn appeared—only twelve are now made. Auburn is one of them.

A thoroughly good car, sold at a thoroughly honest price—and a determination always to be up to, or beyond the lastest developments in the industry, has made Auburn a profitable account for its dealers during all of that time.

The Auburn Company has prospered too. It is today, financially, one of the strongest in the industry and regardless of passing depression, has always been able to discount all bills, to buy its materials on the most favorable terms, and to give its dealers very generous support.

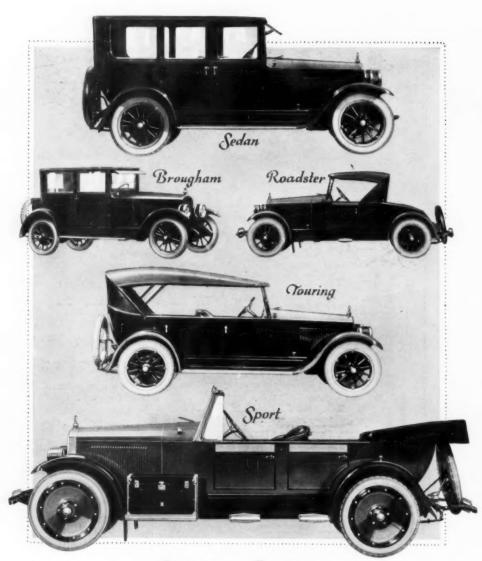
This year Auburn has behind it a volume of advertising and intensive sales effort greater than any that has ever been arranged to help the dealer in the past.

It has the most attractive and salable line in its history; cars that arouse a genuine desire on the part of the prospect, the moment he sees them. Auburn for 1923 offers one of the industry's best opportunities. Write for the facts.

#### AUBURN AUTOMOBILE COMPANY

AUBURN, INDIANA





Standard Models



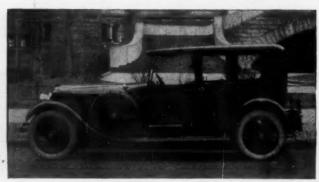
# GATES HUSE

"The Standardized Radiator Hose"



Ask your jobber about the new dealer prices on Gates Vulco Cord Sane Belt.

Made by the World's Largest Manufacturers of Fan Belts.



Minerva-The Car of Royalty

A MESSAGE TO

# High Class Dealers

An opportunity presents itself for progressive dealers to align themselves with two of Europe's finest cars:

# THE MINERVA

of Belgium

Famous wherever automobiles are used. The choice of King Albert, of Belgium, and other reigning monarchs. Owned by a large and rapidly increasing number of wealthy Americans who understand car values and insist on having the best.

Three sizes: 4-cyl. 15 h.p.; 4-cyl. 20 h.p.; 6-cyl. 30 h.p.

Engines: Sleeve valve, monobloc, with Scintilla starting and lighting; 4 speeds forward and reverse. Rugged, simple, economical, fast.

# THE STEYR

of Austria

A clean, sturdy, scientifically designed and constructed 6-cylinder car of medium weight and medium price. Makes the finest sport car imaginable, but is adaptable to any body style.

Both of these quality cars are available complete or as chassis only.

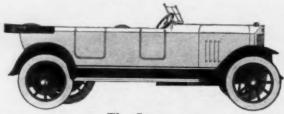
Prospective dealers are invited to send for complete information concerning agency proposition and service arrangements.

Address

### Consolidated Foreign Motor Car Co., Inc.

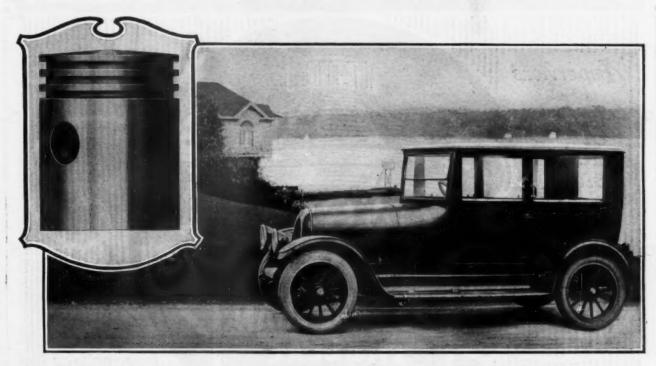
135 West 72nd St.

New York, N. Y.



The Steyr

# A Success



### The E.C.L. (Non-X) Pistons and Franklin Car

Both have proved to be real successes by the efficient and economical service rendered

under the most trying conditions.

Automotive engineers everywhere pay glowing tributes to the E. C. L. Non-X Pistons. Their universal verdict is that:

The E. C. L. Non-X pistons are much more efficient and economical in operation than any other type known.

They eliminate over-oiling, piston slap, loss of compression.

They reduce friction, vibration, carbon deposits, pre-ignition, ring groove wear and premature wear on bearings, to the minimum.

They add to the flexibility and acceleration of the motor, run cooler, and wear longer.

This is borne out by the fact that the E. C. L. Non-X Pistons are now used as standard equipment in the Franklin and many other of America's foremost makes of cars.

The new type of E. C. L. Non-X Pistons run with less clearance than any other make of piston regardless of the material used and without excess friction on the cylinder walls. They actually contract, rather than expand, when subjected to heat.

The E. C. L. Non-X Pistons are manufactured and carried in stock in standards and oversizes for all makes of motors.

A few more territories open to distributors and dealers. Wire or write for particulars.

See our exhibit at the New York and Chicago Auto Shows.

#### E. C. LONG

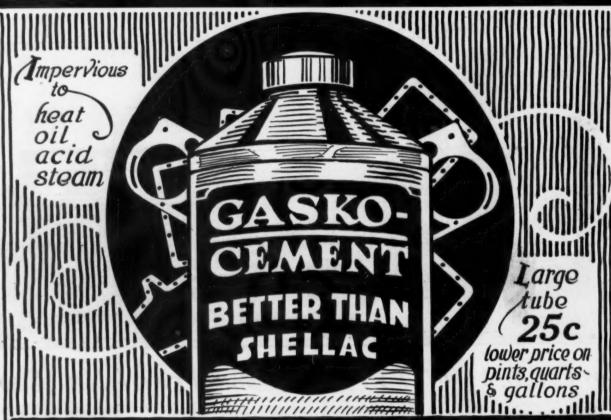
Main Office and Factory:

4834 Beaubien Street, Detroit, Mich.









# Third Year for Gasko

and Going Strong

MORE GASKO THAN EVER IS BEING SOLD-orders and re-orders are coming from every direction, some from foreign countries. It must be good or we would not sell so much of it. If YOU haven't gotten acquainted with GASKO, better write today for a TRIAL TUBE, or send in your order for a trial dozen-you'll order more-WE KNOW IT!

Users say it's great stuff for sealing gaskets—It won't leak and does not dry hard or brittle-preserves the Gasket so it can be used again and again.

Send 25c for Trial Tube

Use it for Motor gaskets—Pipe Unions—Hose Connections—Hand Holes—Pressure Tanks—Hot Water Connections-You'll be pleased with the

Stamps will do.

Please send trial tube of Gasko to:

ASK YOUR JOBBER or write us-Get the trial Tube.

# Your Jobber's Salesman Can Tell You

In his journey from dealer to dealer he gets to know what items are moving, what products can be pushed, what profit there is on different things.

Peerless Products are a hobby with him. He knows he can stand back of them, that they will make good on every claim he makes for them, that the dealer gets a good profit and the consumer gets complete satisfaction. He knows that in selling Peerless to the dealer he is actually helping the dealer build his business.

Let your jobber's salesman tell you his story of Peerless superiority and Peerless profits. Or send us your jobber's name and we'll send detailed information direct.

The CORCORAN Mfg. Co.

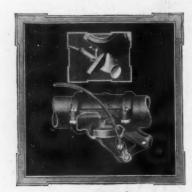
Dept. 8

Norwood, Cincinnati, O.



# Rubu

—a word that means true merit, profit and satisfaction.



#### THE RUBY CUT-OUT

Taking Leadership with Genuine Merit

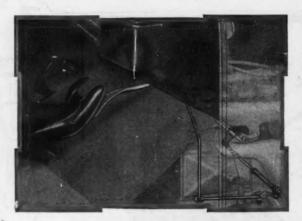
No spring to heat, weaken and permit leaky, fluttering rattle. Instrument board control is neat, strong, heavily nickeled and does no injury to the board. The valve is absolutely immune from all carbon troubles. Exhaust pipe is not severed. No readjusting. Opens wide or part way. Deep, maximum tone. 1½", \$3.75. 15%" to 2", \$6.00. 2½" to 3", \$7.00.

Comes complete—strongly packed

# The Ruby Foot Accelerator

Attaches quickly to ANY model of the Ford car. Does not interfere with removal of floor or toe boards. No rattle. No sticking. No readjusting. Nickel finish.

\$1.75



The Ruby Manufacturing Company Springfield, Ohio

The Ruby Match-Ash Holder



Thick brass, heavily nickeled—clean, safe, beautiful—operated with one hand—no rattle or blowing ash—nothing to break—attaches anywhere in open or closed cars—comes complete with screws for fastening to wood and bolts for fastening to metal instrument boards—\$1.75 retail in the United States. It has no equal.

Dealers: Metal Counter Display Stand furnished with initial orders for six or more.

The Ruby All-Metal FLOWER VASE

will be ready in time for the spring trade

Send C. O. D., Parcel Post, at usual Dealers' Discount.....

# Many of the Finer Cars Adopt the Folberth

MANUFACTURERS of better cars have been quick to recognize the safety and convenience of this automatic windshield cleaner. It is standard equipment on many of the later models.

Among those which will show Folberth Automatic Windshield Cleaner on their exhibits at the New York and Chicago shows are

Studebaker Daniels

Apperson Marmon Winton

King
Paige
McFarlan

for Folber

There is an ever increasing demand for Folberths. Dealers are finding it a fast selling and profitable item; if you are overlooking the profit to be made with Folberths, get busy and order from your jobber now, or write.

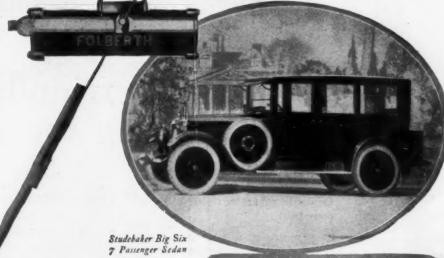
THE FOLBERTH AUTO SPECIALTY CO., CLEVELAND

FOLBERTH

Automatic

WINDSHIELD CLEANER

"It Cleans While You Drive!"



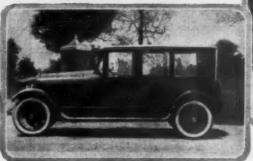
Folberth Exhibits:

New York Show Space D 150 Grand Central Palace

Chicago Show Space 93 Coliseum



Daniels Surburban Limousine 138"



Marmon 34



SUMMERS



Winten Model 40 7 Passenger Sedan



Paige 66 Sedan



# Making friends and making money!

Replacing stripped and battered flywheel teeth with Logan Ring Gears is a service with a double comeback.

The motorist whose starter refuses to work or works badly—because of stripped gears is in a bad way—and his appreciation and friendship naturally go out to the man who effects the cure—especially since this is a permanent cure and is handled more cheaply and quickly than he had thought possible.

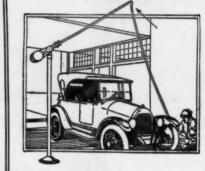
And the Logan man not only makes friends—he makes money.

This is a quality service with a

wide margin of profit. A service which any shop with a lathe is equipped to handle and for which there is widespread demand.

To jobbers and dealers alike this is a proposition well worth considering. Write for details today.

Kauffman Metal Products Co. BELLEFONTAINE, OHIO



#### LOGAN AIR

A quick, clean efficient way of serving air to the motorist.

The movable arm can be swing around to all four tires—the motor-ist can do it himself.

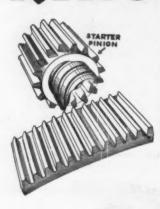
The LOGAN doesn't take much room. It can be placed where it will always be accessible and still be out of the way. It makes your air service impressive.

# LOGAN FINISHED PISTON PINS

Carry a small stock of semi-finished pins and grind them to fit on the Logan pin grinding mandrel.

Finished pins can be supplied if desired. Ask for the details.

# LOGAN FLY RING GEARS



This Logan Flywheel Ring Gear is made of a bar of 1035 S.A.E. steel, shaped to a ring, heat treated and electrically welded at the joint. It has no weak point. The gear teeth are then cut to accurate pitch and given a scientific correct chamfer which insures a perfect mesh with the starter pinion. The finished ring is then hardened.

The teeth are rounded to an angle of 45°—a design which was developed in collaboration with one of America's greatest Starter manufacturers—and which affords quietness of mesh and maximum strength in each tooth.



# What Good Is A Blanket That's Always Blowing Off?

YOU can cure a cold with medicine (generally) — but it takes a surgical operation to remedy the effects of a frozen radiator.

That is why the careful motorist tucks the radiator and hood in a good warm blanket. And he's sure of an easy start, with no costly drain on the battery,—unless, as so often happens, he comes back to find that the wind has lifted the blanket off and left radiator and engine exposed to the cold.

He'd willingly pay a half-dollar-

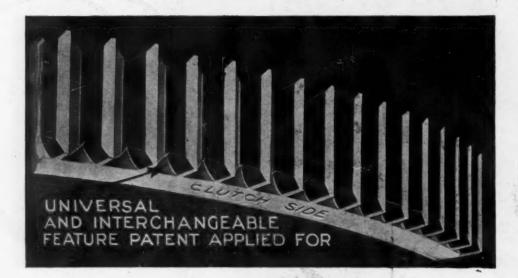
the price of a Welco Blanket Holder—to insure his car against this serious danger. The Welco Blanket Holder is instantly adjustable to any size hood, and it will hold the blanket tight and snug against the strongest wind that blows. Simply hook from handle to handle over the hood.

Here is a sure business bringer for the slow winter months. It fills a long felt need, and its low price assures ready sales and quick turnover. Jobber and dealer discounts are liberal. Write today for details.

The Welker Manufacturing Co.,

Middletown, Conn.

WELCO Products



# Why Carry a Double Stock Of Fly-Wheel Gear Bands?

Many repair shops and service stations are carrying twice the stock of gear bands necessary to give service. They are tying up twice the money necessary and getting one-half the turn-over as a result.

By introducing a patented interchangeable feature whereby one gear can be fitted to different makes or models of cars, we have made it possible for distributors and dealers to carry one-half the usual necessary stock.

This interchangeable feature has also made possible a reduction in the prices of our gears. Knowing this, together with the fact that "Huetter Gears are Better Gears," you will want our new price list. The Strongpoint teeth of Huetter gears mesh quietly and easily with the Bendix Pinion. They are a patented feature approved by the manufacturers of the Bendix Pinion. Our advertising and our rings are guaranteed.

New Price List-Write for It

Huetter's
Fly-Wheel GearBands

Huetter Machine and Tool Company

A man up in New England has perfected a new Air Spring which performs in a manner to amaze those who are familiar with shock absorbing devices.

It gives to the car a velvety smooth riding action never before deemed possible.

It does this without affecting the car's stability—without sidesway and without creating the slightest tendency to upset on sharp turns.

It is simple in construction, simple to install (requiring no cutting or drilling of frame), simple to maintain, and costs less than any other like device.

And it can be sold for a wider range of cars at a bigger profit per sale.

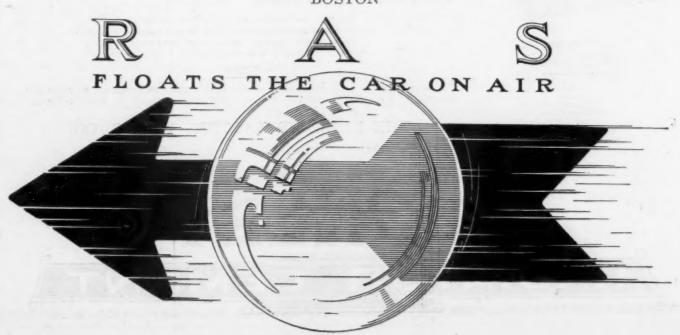
This amazing air spring will be pictured and described in this paper January 25th—at which time the plant and its equipment will be ready for quantity production.

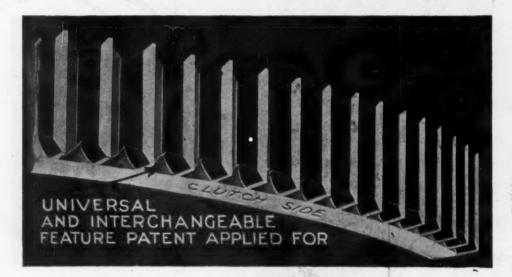
Watch for the Announcement

#### January 25th

Until January 25th, the address is:

NEW AIR SPRING—SUITE 410—185 DEVONSHIRE ST, BOSTON





# Why Carry a Double Stock Of Fly-Wheel Gear Bands?

Many repair shops and service stations are carrying twice the stock of gear bands necessary to give service. They are tying up twice the money necessary and getting one-half the turn-over as a result.

By introducing a patented interchangeable feature whereby one gear can be fitted to different makes or models of cars, we have made it possible for distributors and dealers to carry one-half the usual necessary stock.

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New Price List-Write for It

Huetter's
Fly-Wheel GearBands

Huetter Machine and Tool Company

557 Kentucky Ave.

Indianapolis, U. S. A.

A man up in New England has perfected a new Air Spring which performs in a manner to amaze those who are familiar with shock absorbing devices.

It gives to the car a velvety smooth riding action never before deemed possible.

It does this without affecting the car's stability—without sidesway and without creating the slightest tendency to upset on sharp turns.

It is simple in construction, simple to install (requiring no cutting or drilling of frame), simple to maintain, and costs less than any other like device.

And it can be sold for a wider range of cars at a bigger profit per sale.

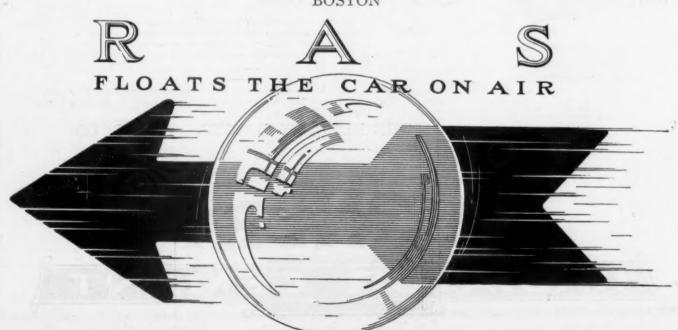
This amazing air spring will be pictured and described in this paper January 25th—at which time the plant and its equipment will be ready for quantity production.

Watch for the Announcement

#### January 25th

Until January 25th, the address is:

NEW AIR SPRING—SUITE 410—185 DEVONSHIRE ST, BOSTON





# A Name That's Known Around the World



Prices:

1/2 doz. to 3 doz.
cans \$9.00
3 doz. to 6 doz. cans 8.75
6 doz. to 12 doz. cans 8.50
1-Gross Lots—
\$96.00 Per Gross
2- to 4-Gross Lots—
\$90.00 Per Gross

BURNLEY'S is a real cement, made by a pioneer soldering manufacturer, maker of BURNLEY'S Soldering Paste, Soldering Salts, Soldering Stick, Soldering Solution, and first to put Soldering Paste on the World's markets. BURNLEY Radiator Cement immediately and permanently stops leaks in automobile radiators, cracked cylinders, steam and hot water boilers.

It is absolutely guaranteed by the manufacturers—but its best guarantee

lies in the years of experience, the reputation for extraordinary skill and honesty of manufacture, that are inseparable from BURNLEY products. Poured into the radiator it finds its way at once to any leaky places and instantly seals them—not temporarily or flimsily, but with a practical, lasting, correctly made solder.

We know of nothing now on the market to compare to BURNLEY'S Radiator Cement. It is really unique in the field.

Do you realize what eleven million radiators in active service means? The profits from a really good radiator leak-stopper are worth while. Ask your Jobber.

#### FREE

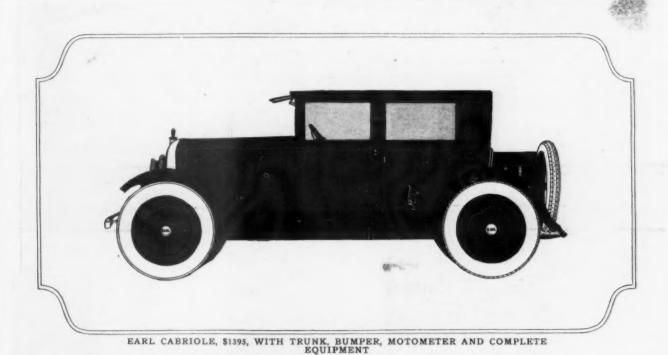
We have compiled a set of invaluable, tho simple rules and methods of successful soldering. Will gladly send this to any tradesman interested in better soldering.

#### THE BURNLEY BATTERY & MFG. CO.

Pioneer manufacturers of Soldering Salts, Flux, Paste, etc. First to put Soldering Paste on world's markets.

NORTHEAST, PA.





# EARL Cabriole Wins Owner Approval

Distinction, performance and tangible value of fully equipped enclosed car make it one of season's distinct successes

Less than five months before the American public, the Earl Cabriole has already established itself as one of the accepted new body types and greatest values among American motor cars.

Stop at the Earl Exhibit at the New York, Philadelphia, Cleveland, Detroit or Chicago Show—check and compare the Earl chassis units—size up the graceful lines and unusual finish of the Cabriole body—and you will know why this new Earl has impressed the trade and owners of the entire country.

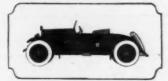
Go over this Earl—any Earl—unit by unit, from its dynamic longstroke motor to its 56-inch rear springs. Measure its deep 7-inch channel frame, with five rigid cross members. Note its sturdy Earlforged axles, its Earl-built steering gear, its extra-capacity radiator, its accessible controls and effortless clutch, brakes and transmission.

Study the details and equipment which determine the quality of this great motor car—the genuine walnut garnish rails, mouldings and instrument board, the rubber covered brake and clutch pedals, the substantial construction and careful finish of every unit in body and chassis. No other car in its price range combines so many quality and comfort features as you will find in every Earl at the Show.

Size up the Cabriole and the full Earl line at the Show. Judge their performance and dollar value for yourself. Let us show you how a big Earl territory and the liberal Earl contract will make money for you in 1923.



Ear: Touring Car \$1095 fully equipped



Custom Roadster \$1485 unusual equipment



Earl Sedan \$1595 with complete equipment

Touring		(	7	D)	Г			0	9		0		0			\$1095
Custom	I	2	0	a	d	8	8	e	r			0			0.	1485
Cabriole								0		0		0	0	0	0	1395
Brougha	n	n				0	0	0								1595
Sedan .				0			0	0	0	0	0	0				1595

Prices f. o. b. Jackson

### Earl Motors, Inc. Jackson, Michigan

The right car, at the right price, with the right dealer discount.



Write or wire today for catalog, terms and list of open territories.



Speed-O sells on sight nine times out of ten There's hardly a mechan-

At the

New York

Show

Grand Central

Palace
January 6th to 13th
Space D-172

ic, chauffeur or motorist

in the United States who wouldn't grasp the chance to own a SPEED-O Multiple Valve Spring Lifter — once he saw it work.

For, unlike the usual run of valve spring lifters, SPEED-O banishes the tiresome, temper-testing process of handling but one spring at a time.

It handles from EIGHT to TWELVE—and with surprisingly little effort.

Once it has been snapped into place, the springs—kept in position—are quickly compressed, and the valve stem keys are immediately accessible

Lifts 8 to 12 Valve Springs at one time.

for removal. It takes but thirty seconds to have the valves ready for grinding.

And there are no skinned knuckles no pinched fingertips. No loss of time —or patience.

SPEED-O is equally effective on all engines. It is distributed exclusively through automotive jobbers. If your jobber cannot supply you, write direct.

JOBBERS: Be the first in your territory to represent us on this fast-selling necessity. Full protection is assured. Write for the interesting details of our attractive trade offer.

Speed-O Multiple Valve Lifter Corporation

1926 Broadway, New York City

SPEED-O MULTIPLE VALVE SPRING LIFTER

# **Most Complete Line** Manufactured in the **United States**

Dependable Reamers

TWIST DRILL

SHART TOOLS FOR EVERY MAKE OF CHE

Moore & Moore, Inc.

Reading, Pa.

# THE BUSINESSURE UBRICATING SYSTEM





FILLS BY SUCTION

The Rose is the only high pressure lubricating system on the market that does not require a special filling device. It fills by its own suction—a quick, clean, easy method appreciated by every owner. To fill: (1) Remove bottom cap, (2) Loosen pressure thread nut, (3) Place open end in grease and, (4) Up-stroke of plunger fills the gun.



Designed and manufactured by the makers of America's leading Tire Pump, "The Rose."



There are 5,000,000 prospects for this outfit.

Every other motorist that enters your shop owns a Ford and will be vitally interested to know he can now buy a complete pressure lubricating system

The Rose is made for every make of pleasure car, truck and tractor. Ask 'em to buy. Every Rose feature, including price, has a big appeal.

possibilities of this item, alone, are enormous.

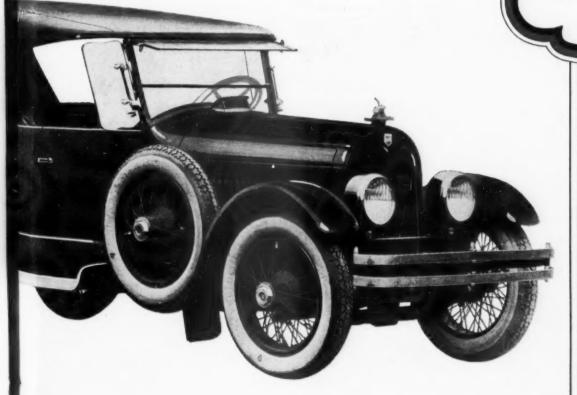
for \$8.64. This includes the pressure gun, shackles, tie rods, steering bolts and all other fittings. The sales

You Can Outfit Any Car, Truck or Tractor from This Display

The Rose "Sales Catcher" Counter Display is a regular miniature service station. From it you can fully equip any make of auto, truck or tractor. It contains four lubricators complete with a large assortment of fittings. We suggest this for your first Rose Lubricator stock. Ask your jobber for complete information or write to us direct.

Frank Rose Manufacturing Co. HASTINGS, NEBR.

# Howabout YOU in 1923



**APPERSON** 



# Apperson Dealers Will

There is to-day no sentiment in the automobile business. If a dealer can't make money out of a car, he drops it. He is in business to make money—not to satisfy the sales ambitions of the factory or merely because it gives him prestige to represent a well-known car—his job is to make money. Therefore, the intelligent, far-sighted dealer is, to-day, thinking for himself.

\* \* \*

As a matter of self preservation he is sizing up his present line *and other cars* purely on the basis of how much money he can make in 1923—and thereafter.

当当当

He is vitally interested in the car, the factory, and the factory policy. He knows that he has got to have a car that will sell—and stay sold. A car that will make a better demonstration than other cars; and then go out and run longer, more smoothly and satisfactorily, with less trouble and at less expense than other cars. A car that looks better and is better. A car that is so correctly engineered and conscientiously built that it does not eat up all the profit on service. A car advertised to the point where people know the truth about it and believe in it. Finally, he must have a car with a clean history—a car whose engineering record has no black spots on it. SUCH A CAR IS THE APPERSON.

# Make Money in 1923

Behind the car he must have a strong, clean, square-dealing factory, whose word is as good as its bond. A factory whose past calls for no explanations or apologies. A factory big enough and sufficiently equipped to make all the cars he can sell and deliver them to him—in A-1 condition and ON TIME. SUCH A FACTORY IS BEHIND THE APPERSON.

#### 海南南

The successful dealer must have a factory policy that is based on the one idea of the prosperity of the dealer. A factory policy that does not shove cars down his throat, does not ride him, does not make him stretch his financial facilities to the cracking point. Does not break him. A factory policy that backs him up and makes him strong with his banker. SUCH A POLICY IS THAT OF THE APPERSON.

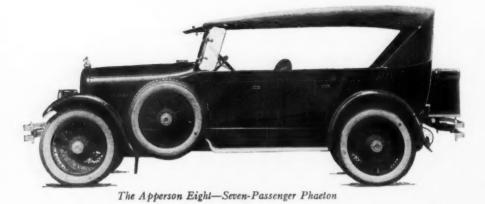
#### 未未永泉

These things being true of Apperson, this car, this factory and the Apperson policy commend themselves to those intelligent dealers who are out in 1923 to make money.

See the new Apperson Six and Apperson Eight at the New York Show, January 6th to 13th, in Space B-15, and at the Chicago Show, January 27th to February 3rd, in Space A-4 at the Armory.

General Manager Apperson Bros. Automobile Co.

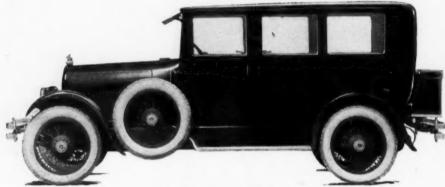
Kokomo, Indiana



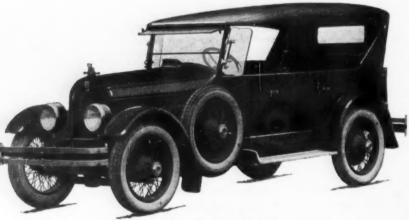


# **APPERSON**





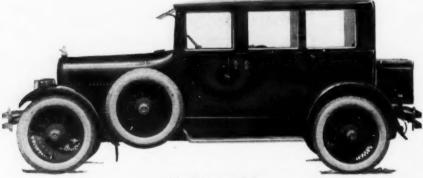
Seven-Passenger Sedan



Five-Passenger Phaeton

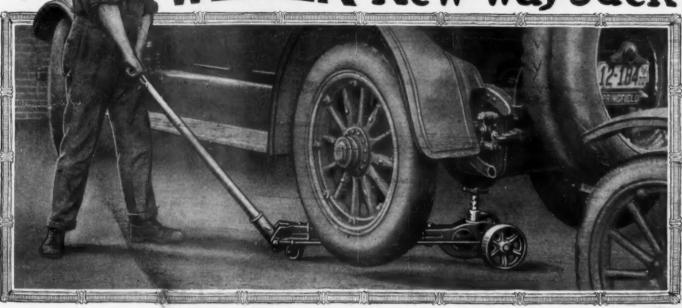


See the new Apperson Six and Eight at the New York Show, space B-15, and at the Chicago Show, space A-4 at the Armory



Five-Passenger Sedan

# with this Model B WEAVER New-Way Jack



# New features

TELESCOPING STANDARD can be dropped to minimum height of 8 inches, sufficiently low to be inserted under any car axle, and raised to a maximum height of 171% inches, high enough to reach unusually high axles.

STANDARD SLEEVE supports standard rigidly when drawn up to its maximum height and prevents binding under heavy loads.

ROLLER BEARINGS are located within axle housing, instead of within wheel hubs, preventing undue friction and wear under side thrust.

REAR CASTER is clamped to jack by heavy bolt and can easily be replaced if damaged. Two sets of ball bearings reduce friction and prevent binding.

UNUSUALLY HEAVY, DUR-ABLE WHEELS that will stand up under the hardest service. Can be had with heavy rubber tires at a slight additional cost. It's an easy matter to get a car out of a tight place in your garage or repair shop in a hurry if you have a Model B Weaver New-Way Jack. If you haven't room to operate from the front or rear of the car, you can insert the Jack from the side of the car as illustrated above. The long body of the Jack enables you to reach the axle with ease and the fact that the wheels of the Jack pivot and are controlled by the handle makes it easy to guide the Jack into just the right position under the car the first crack out of the box.

The wheels of the Jack can then be cut in line with the car axle and the car drawn directly sideways without having to raise it high enough to permit the rear end of the Jack frame to pass directly under the car.

This is only one of a number of exclusive features of this new Model B that will enable you to give quicker, better service and thus increase your profits. We have prepared a special folder describing this Jack in detail. Your copy is waiting to be mailed. Won't you write for it today?



WEAVER CANADIAN









# New Life For Motor Cars

DOWMETAL has filled a long felt want in contests which require speed and smoothness—power and endurance.

In many a 1922 race all of the leading places have been taken by DOWMETAL users. Many track records have been broken by DOWMETAL equipped cars. Motor boats and planes have been speeded up by the use of DOWMETAL Pistons. These facts have given DOWMETAL unquestioned acceptance and preference where speed is sought.

But the ever growing preference for DOW-METAL Pistons in passenger cars comes from another quality—smoothness—a quality attained by removing the burdensome

weight that drags and jerks at the end of the connecting rods—thousands of times in a minute. The reducing of rattle and vibration is so marked as to give a four cylinder car the smoothness of the more costly motors.

In speed, power and hill climbing performance, DOWMETAL stands alone. DOW-METAL Pistons slide more smoothly, wear longer and stand up under tests that no other Piston could endure.

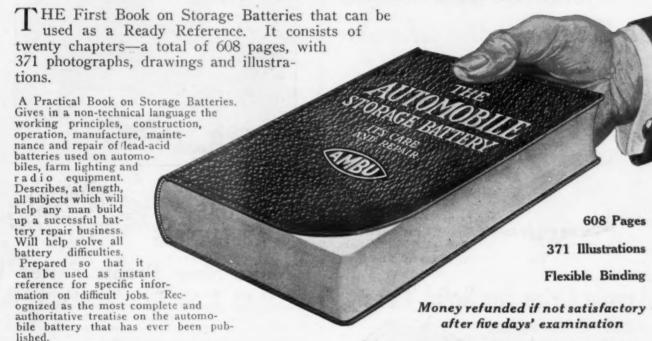
For a smoother running car—for economy—for a longer lived car, just get these lightest weight Pistons into your motor. Ask your dealer. Write for illustrated folder.



#### Announcing the Third Printing

of the Original and

#### Most Practical Hand Book Ever Written on Storage Batteries



#### **OVER 35,000 SOLD**

The book was written to fill the need for a complete treatise on the automobile storage battery for the use of any man interested in storage batteries. The rapid sale of the first and second printings, and the letters of appreciation from those who have read it, proved that such a need existed.

This Third Printing has been entirely revised and re-written, and covers the improved methods in repairing and servicing storage batteries.

There are countless suggestions and ideas on such subjects as the manufacture of batteries, battery charging, lead burning, testing and examination of incoming batteries, battery overhauling, and battery shop business methods. Gives numerous short-cuts, and supplies information that may be worth hundreds, perhaps thousands, of dollars to a man in a very's time. lars, to a man in a year's time.

It is 608 Pages of ready-to-use valuable information. Printed on the best quality enameled stock which brings the 371 illustrations out in exact detail.

This book full of pages of worthwhile cashable information cannot be described in this advertisement. You can only judge by reading and using it. If it is not all you think it should be, your money will be refunded if the book is returned within five days. Price delivered, only \$5.00.

Published by the

#### American Bureau of Engineering, Inc.

Manufacturers of AMBU Battery Service Equipment

2634 Prairie Avenue,

CHICAGO, ILLINOIS

"The Best Equipped Shop Gets the Business"

The best battery service equipment carries the AMBU trademark and is distributed by leading jobbers selected for their ability to serve. Send for FREE catalog of AMBU Equipment and name of your nearest jobber. Address Dept. MA-1.

#### RECOMMENDED BY ALL LEAD-ING AUTHORITIES, including such men as-

Geo. M. Howard, Dept. of Development and Design, Electric Storage Battery Co. (Exide), Philadelphia, Pa.

Frinadelphia, Fa.
H. A. Harvey, Sales Mgr.,
U. S. Light & Heat Corp.,
Niagara Falls, N. Y.
Lawrence J. Pearson, Engineer,
Philadelphia Storage Battery Co.,
Philadelphia, Pa.

S. Armstrong, Sales Mgr., Vesta Battery Corp., Chicago.

J. R. Blocher, Asst. Sales Mgr., The Prest-O-Lite Co., Inc., New York, N. Y. E. B. Welsh, Adv. Mgr., Westinghouse Union Battery Co., Swissvale, Pa.

Raymond L. McFarland, Dept. of Trades & Industries, Iowa State College.

Order From Your Jobber or Just Send This Coupon Today

AMBU
2634 Prairie Avenue Chicago, Ill.
Gentlemen: Please send the big new edition of "The Automobile Storage Battery" Book. I will deposit with postman \$5.00 on delivery and if I decide within five days not to keep it, my money will be refunded.
Name
Street
Town State
☐ Also send FREE CATALOG of AMBU Battery Service Equipment and name of nearest jobber.

# Motorists' Conveniences See Them at the Shows

### ARROW GRIP CHAINS

with Quick Replacement Fasteners



for Pneumatic Tires

Win instant favor by their ease of attachment, dependability and all-around service. Quick Replacement Fasteners permit cross chain replacements being made with the hands alone, without removing chains from the tires.

# **Arrow Grips for Solid Tires**

The Motor's Pal. Keep the truck going regardless of weather conditions.

Two parts only, rustproof clamp and chain. Clamp can remain on spoke permanently; chain is snapped on in a jiffy when the need arises. Only small piece of chain needed for replacements.



# Arrow Grip Jacks

Handle Controlled

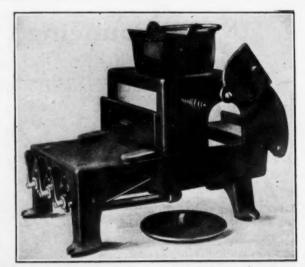


Push under the car with the handle-a few easy turns will raise or lower the car. No soiled hands-no grease spotted clothes. Handle folds up. Entire jack packs conveniently in small space.

Stock the complete Arrow Grip line. You and your customers will both be satisfied. Ask your jobber. If he can't supply you, give us his name and we'll see you get 'em QUICK.

#### ARROW GRIP MFG. CO., INC. GLENS FALLS, N. Y.

Export Office: 280 Broadway, New York



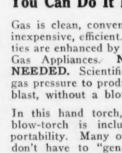
# **JOHNSON APPLIANCES**



### Make Shop Profits Fatter

You can get more money by doing your own heat-treating, rebabbitting and tempering with this No. 118 bench furnace. It never consumes more than 40 feet of gas per hour, yet produces temperatures up to 1800°. It takes a 20-lb. melting pot through the hole on the firebox, and quickly fuses soft metals. Long rods can be slid in the side openings. Heats the largest soldering coppers, branding irons, etc.

#### "If It's Done With Heat You Can Do It Better With Gas"



Gas is clean, convenient, easily controlled, inexpensive, efficient. All these good qualities are enhanced by using it in JOHNSON Gas Appliances. NO AIR BLAST IS NEEDED. Scientific advantage is taken of gas pressure to produce the effect of an air blast, without a blower, tank or piping.

In this hand torch, every benefit of the blow-torch is included, except complete portability. Many others are added. You don't have to "generate," the pilot light ignites it instantly. Thumb cock regulates intensity of flame. Big handle makes management easy. It's light and conveniently

#### Free Book Tells All

Descriptions of all JOHNSON Gas Appliances with illustrations, will be sent for the This book tells proper regulation of gas burners, how to save money in the shop, the proper colors and temperatures for heat treating. Ask now for yours.

#### Johnson Gas Appliance Co. Cedar Rapids, Iowa

C. B. BABCOCK CO.

768 Mission St.

San Francisco, Calif.

Pacific Coast Representative



The Little Watchman for Fords

### **Ford Owners Have Long Wanted This Triple Protection**

Ask any Ford owner:

IF he enjoys removing the seat and poking a measuring stick down into the tank every time he wants to know how much gas he's got-

IF he enjoys getting stuck without gas on a country road, miles from a supply sta-

IF he enjoys the thought of having his car stolen whenever he leaves it-

IF he would pay five dollars for a Little Watchman that would put an end to these annoyances and risks-a Little Watchman that anyone can install-a Little Watchman that attaches to the front of the driver's seat, tells at a glance how much gas there is, provides a reserve supply of fuel when the gas runs down, and locks the gas so tight with a patented tumbler lock that no thief can drive the car away!

A good friend, is this Little Watchman. And a sure money maker. Sells because it's WANTED. Requires no service. Good discounts to jobbers and dealers. Write today for full particulars.

Three styles-coupe, touring and sedan.

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Rochester, N. Y.

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k you enough for what you have done for me. A. C. ML ELECTRIC SERVICE STATION, MILWAUKER, WIS-

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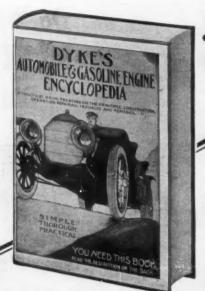
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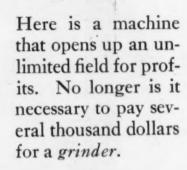
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The profits on a regrinding job should stay in the pockets of the man who lands it. Be that man. Equip yourself with a



#### Portable Cylinder Reborer and Grinder IT BORES AND GRINDS

This practical and accurate tool will put you in a position to regrind cylinders in your own shop, and will bring you thousands of dollars worth of other work.

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Engine & Mfg. Co.
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### "Open Cars now heated from 40° to 70° in just thirty minutes"—

says The Packard Motor Co.

and in substance they say further that The Francisco Auto Heater not only keeps closed cars warm within but constantly supplies clean, fresh air. "The equipment can be quickly and inexpensively installed—and supplies sufficient heat to make our touring cars comfortable for winter driving."

The

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AUTO HEATER

"for all models of the leading cars"

Ventilates

Tests have proven the Francisco Heater changes the air completely in one to two minutes. Such efficient ventilation precludes all possibilities of steamy windows and insures pure, fresh air in addition to cozy warmth.

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Special FRANCISCO HOT BLAST CAST HEATER for Fords actually increase mileage 25% to 35%. Closed and Open Cars can be kept cozily warm. Send for our descriptive circular on this popular priced, quick selling heater.

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1016 Mt. Pleasant Ave., Columbus, Ohio



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Are you having trouble in rebushing steering knuckles? This is a ticklish job at the best. Just a few thousandths play and a bad rattle develops. In other words, unless the bushings are reamed accurately, you have a dissatisfied customer.

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AT THE NEW YORK MOTOR SHOW

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Sales on the famous Turner 2 in 1
Timer for Fords have never been
so great as at the present time.
Time and again our production has
been increased (several times
doubled) to meet the ever growing
demand for this great timer.
Has stood repeated and rigid tests
for over five years. Increases
power, insures an instant start in
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front plugs, saves gasoline and
stops motor "kicking." Is oil,
grease and water proof. Requires
no oiling and is easily installed.

These are the Points of Quality Construction that are Selling Turner 2 in 1 Timers.

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1.—Brush container is of special alloy metal and will last indefinitely.

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Millions of car owners will welcome the GOODRICH DE LUXE Fabric Cord Fan Belt because it will not slip or stretch. It keeps the fan working as it should work, and thus stops engine heating. The combination of strong rubber impregnated cords and fabric layers give it great tensile strength and gripping power.

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You can impress on your trade that GOODRICH DE LUXE Fan Belts are the most economical. They last longer. They conserve the life and energies of the engine-keep the driver cool.

#### Stock Them NOW

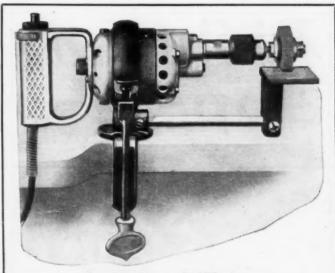
Car owners now having their automobiles overhauled, will find it to their advantage to put on a GOODRICH Fan Belt. This is the ideal time. We supply you with an accurate chart showing size to apply on all cars, trucks and tractors. See our nearest branch for details.

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"Best in the Long Run"





### Just the drill for automobile repairmen

Ever since the advent of the electric hand drill automobile repairmen have wanted a tool which in capacity, cost and general usefulness would be between the breast drill and the heavy electric hand drill.

At last such a tool is available in the Jones Electric Hand Drill. It is a powerful, compact tool capable of drilling through the toughest materials and with a capacity up to 1/4 inch. It is of the highest quality materials and workmanship and will cost you only \$25.00. Fitted with universal motor and Jacobs chuck.

At little additional cost, valuable attachments can be obtained. These include a bench clamp which makes this drill a useful bench tool, arbor, wire brush, cloth buffer, battery terminal drills, circular saw, grinding wheel, a complete ma-

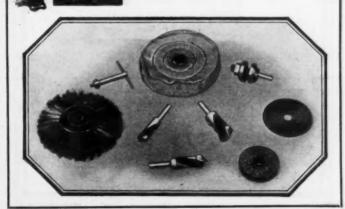
chine shop in one tool.

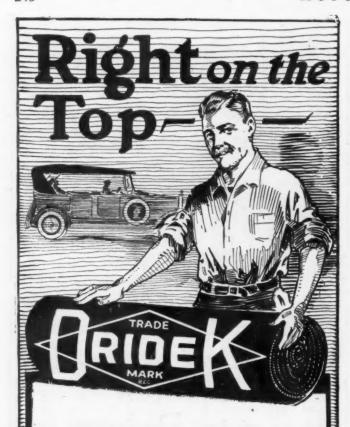
We shall be pleased to forward descriptive matter. Write us today.

Agents Wanted

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### Right on the Top well expresses Dridek quality in every way.

Absolutely waterproof, can be folded and creased without marring the surface and it stands up under the most continuous kind of hard

Every yard in every piece is carefully inspected both in the finish and in the fabric used and the quality is always the same.

Place your orders where you get your money's worth in service and satisfaction.

Dridek makes the ideal automobile top.

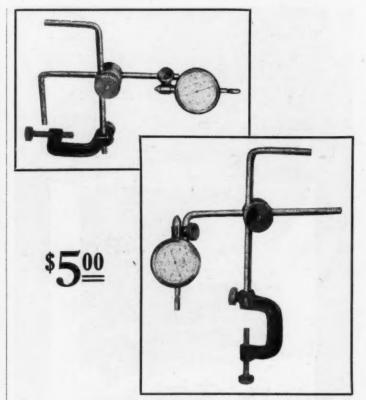
Send for samples and prices.

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### A Hundred Times More Useful

### -Your Ames Dial Head

At a cost of only \$5.00 your present Ames Jr., Cylinder Gauge becomes a complete gauging and testing apparatus.

Tests straightness of crankshafts, camshafts, valvestems, also the lift of valve and cams.

Checks thickness of piston rings, shims, bearing liners; also diameters of pistons, wrist-pins, valve stems, push rods, transmission gears and shafts. Shows if flywheels run true.

Price of Attachment only is \$5.00. Junior Dial Head only costs \$10.00. Cylinder Gauge Mount (without Dial Head) \$5.00 Cash or C. O. D.





See the Ames exhibit at the New York Automobile Show. Space C15-D.





The Jeavons Spring Lubricators assure more mileage and greater riding comfort. They protect the moving leaves from mud, water and provide constant lubrication.

The Jeavons is made of a specially woven black enameled duck of exceptional strength—it's water and oil proof, and encloses a specially woven wicking that surrounds the spring leaves.

It is not advisable to pour oil on the moving leaves—and then expose them to mud and flying dust. You wouldn't subject any other mechanism to such treatment.

If the original lubricant is allowed to work out from between the leaves, friction is increased, grit, dirt and water enter, the leaves rust and the car rides stiff and hard.

Jeavonize your springs and retain riding comfort—eliminate squeaks and assure proper spring action throughout the life of the car. Jeavons Covers conform to the lines of the spring. Unnecessary to remove spring clips when installing.

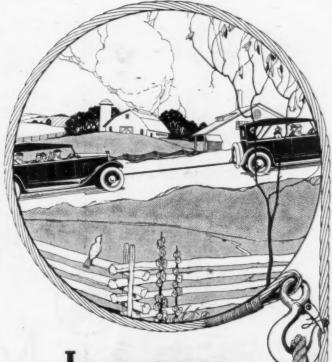
If you are not yet handling the Jeavons, get the agency now and watch your accessory sales climb.

Many car dealers make them standard equipment. Orders shipped same day as received.

The Jeavons Manufacturing Co.
Frank N. Sealand, Pres.

2540 Prospect Ave. Cleveland, Ohio

EAVONS
SPRING LUBRICATOR
[Patented April 18, 1911-April 13, 1915]



# Insurance Against Delays

Any motor may stall—any car get stuck in mud—any one of a dozen minor accidents halt you on the road—perhaps miles from the nearest garage. But no matter when or where you're stranded, any autoist is sportsman enough to give you a pull, if you've along a

# BASLINE

You can depend on the "Little Steel Rope with the Big Pull" to haul you out of trouble every time. Made of famous Yellow Strand Wire Rope, with patented Snaffle Hooks that attach instantly and securely. It's the original wire rope towline. Fits under seat cushion. With it you can pull out of a ditch or mudhole on your own power. At dealers, \$4.95 east of Rockies.

POWERSTEEL AUTOWLOCK, also made of Yellow Strand Wire Rope, is a safeguard against stealing of car or spare tire. Has sturdy spring lock that can't be picked. At dealers, \$2.50 east of Rockies.

POWERSTEEL TRUCKLINE, "big brother" to Autowline, is for extra-heavy towing. Retails, east of Rockies, at \$8.65 with plain hooks; \$10.10 with Snaffle Hooks.

#### TO THE TRADE:

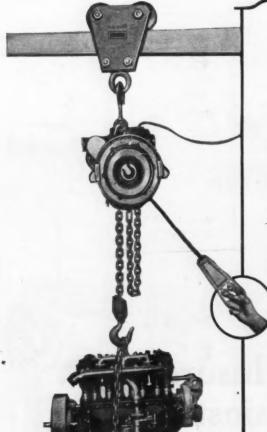
Like all widely-advertised products, Basline Autowline, Powersteel Autowlock and Powersteel Truckline are widely imitated. But there's a good axiom that can be applied to all substitutes: If the original article were not better, it would not be imitated. Push the 3 B & B products—they're the real thing! There is money in them for you. Write today for our attractive proposition.

#### BRODERICK & BASCOM ROPE CO.

ST. LOUIS-NEW YORK

Manufacturers of Celebrated Yellow Strand Wire Rope





### Motor Driven Chain Hoist LIGHT—PORTABLE—STRONG

One of the best investments a service station proprietor can make.

MOTORBLOC is hung up like any chain hoist. Can be hooked up and plugged in anywhere, just like an electric drill. It takes less current than a laundry iron.

And a ton can be raised with a 5 oz. pull instead of a 90 lb. pull. The self-contained pendant controller is easily oper-ated by the fingers of one hand, leaving the other free to guide the load.

For occasional lifts at points where electric current is not available, the hand chain can be quickly applied and the hoist operated as an ordinary block.

MOTORBLOC puts shop on an efficient working basis—gets the most out of each man and each minute.

It doesn't cost much to own the MOTORBLOC—and it saves a whole lot. Get the de-tails from our descriptive data. Sent on request.

PHILADELPHIA

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### Can't Blow Out-Serve Longer

-insure permanent customer satisfaction

Don't take the chance of losing a good customer through a poor gasket. It doesn't pay.

Never - Leak banishes all chance of blowouts by binding the bottom layer of copper over the top layer.

And the corners are skilfully scalloped to prevent buckling-making them absolutely heat, oil, gas and waterproof.

Never - Leak Gaskets will help you build a reputation for good repairs. No comebacks -for they can't leak.

A sample gasket for any car, truck or tractor sent on request, either direct or through your iobber.

Never-Leak gaskets are listed, pictured and priced in our catalog-copy sent on request.

THE FITZGERALD MFG. CO.

TORRINGTON, CONN.

NEVER-LEAK Cylinder Head Gaskets



#### Here's the remedyfor all hood rattles

And to prove it — a quarter of a million

Jorgensen Hood
Silencers have been sold already — and only a short time

on the market.

Think of the number of cars in use—and there's your field.

The vacuum cup, through suction,

grips the side of the car hood like a vise. The hood fastener fits down over the slot—and the rattle is killed for all time.

Simple — easy — but so effective that you can't hear a sound from the hood.

Jobbers and Dealers—these Hood Silencers are sure fire sellers and money-makers. No More R a t t l e

Special display box with a smashing sales appeal design attracts immediate attention. Holds 12 sets. \$1.00 a set of Four. \$1.50 a set of Six. \$1.25 a set of Four, Oldsmobile and Nash model. Nearly every car provided for. Let's get together at once.

Jorgensen Hood Silencer Co., Erie, Pa.

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Why hand over to others the big money on the best part of your motor overhaul jobs?-The cylinder renewing and refinishing.

Keep this extra profit for yourself this year-besides give your patrons better cylinder work and quicker service.

A Stormizing machine will do this for you. It's the new, patented way of cylinder machining and refinishing. Automatic and selfcentering. Produces cannon-bore trueness and gun-barrel finish on all cylinders.

Send at once for full facts on Stormizing machines. Investigate now. Don't wait. Get all the profits this year on your motor jobs. Write for catalog today.



Furnished for your building with each Stormizing—also a supply of trade helps to bigger, better service and larger profits.

25%" to 12". Portable Model S. 254" to 41/4".

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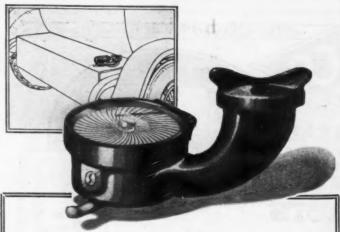
Semi-Portable, Model M. Capacity

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Storm Finishing Head used with electric drill.





New gasoline tank recorder, filler, indicator and car lock if desired, in one apparatus.

Permanently records amount of each tank replenishment and amount used; and

#### Forces This Record to Be Made

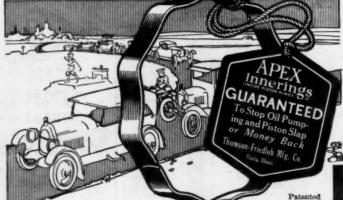
Locks fuel supply line; ignition or motor starter. filling-spout, gasoline gauge and Replaces usual outlet-only ONE hole in tank shell.

This pioneer patent covering any kind of tank re-cording apparatus forcing a record to be made controls this line of industrial development.

This basic patent for sale

Address: Box No. E-6035, care of Motor Age 239 West 39th St., New York City





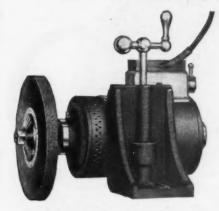
#### Car Owners Tell Genuine Apex Innering Story

Your customers will be loud in praise as soon as you start to install Genuine Apex Innerings to stop piston slap and oil pumping without reboring. Read these:—
"Best invention ever put on the market for used cars."—L. J. Lanse, Delphos, Ohio.
"Gave my 1918 Saxon Six more pep and increased my mileage per quart of oil from 60 to more than 200 miles."—B. F. Irwin, St. Charles, Iowa.
"Made my Chalmers 6-30 run like a new car; increased compression, power and absolutely eliminated oil pumping and piston slap."—Logan B. Woodward, Kane, Pa.
Fastest selling accessory in the world. Installed under regularings, form perfect oil-and-power-tight seal. Old motors run like new. Only device invented that expands and contracts piston rings to fit tapered and egg shaped cylinders.
Only 30c each retail. Larger than 36" wide or 5" dia. 50c. Quickly installed. Ask your jobber. If he has none order a dozen sets today. Give size piston rings.

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"first in the field"

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For grinding flat or round surfaces, and finishing semi-finished pistons, it is ready, by throwing the switch, to turn out the work accurately and quickly.

Write for complete catalog of Clark Drills and Grinders with built-in motors.

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Factory and Gen'l Offices, Louisville, Ky.





#### BUY THIS CYLINDER-GRINDING LATHE ATTACHMENT

It will make your lathe the best paying piece of machinery in your shop. Does splendid accurate work. The only difference between it and \$2500 machines is speed. For the small shop the Fox has no equal. Costs little. Pay for it on easy terms. Get the Fox booklet today.

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Machinery and Supply Co.

Machine Shops Omaha, U. S. A.



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Tough jobs become easy jobs—out-ofthe-way places become accessible places—difficulties disappear—nuts are *not* hard to get at.

Ever since the need arose for socket wrenches to reach and remove nuts—Walden-Worcester has supplied them.

New demands—new wrenches. But always first in the field with a wrench to reach any nut on any standard make of car. In fact there's a Walden-Worcester wrench for practically every nut on every make of car.

The first demand, in 1910, for a particular socket wrench, was supplied by Walden-Worcester; 1922 sees every conceivable socket wrench requirement supplied by Walden-Worcester.

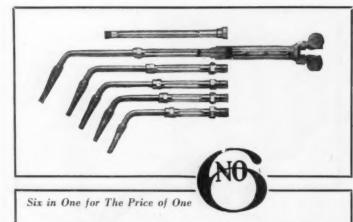
At your jobbers anywhere—any time. Always available. Immediate delivery. No waits. No delays.



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GENERAL OFFICES AND FACTORY WORCESTER, MASS.



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The tips have the same size bore throughout their entire length which means that they can be dressed off with a file without varying the size of the flame—a feature which adds to their life.

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THE MEACHEM GEAR CORP'N Syracuse, N. Y.

#### OVER 50,000 MILES NOW REPORTED ON

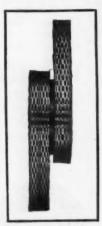
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FRONT END MOTOR CHAIN DRIVES AND STILL IN GOOD CONDITION



NOT ONE OF THESE **CHAINS** HAS BEEN KNOWN TO SKIP A **SPROCKET** TOOTH

Interchangeable on the Sprockets Furnished with the Car



Welding and

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The Whitney Mfg. Co. HARTFORD, CONN.



#### The G-G-H PREMIER Vizor "Triple-Curve"

The original, exclusive "triple-curve" arch construction

1. Strength—No warping, wrinkling, or sagging. The Premier Vizor weighs only 4½ pounds. Will outwear

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2. Beauty—The Premier Vizor improves the appearance of your car. Made of re-inforced aluminum frame. Panes of genuine Du Pont Pyralin. Brackets are black-enameled, with nickeled trim.

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One model fits all makes and models of cars, open or closed. Install it in five minutes yourself with only a

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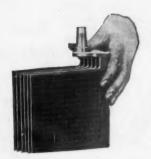
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GRIGSBY-GRUNOW-HINDS CO. 906 W. Lake St. Chicago, Ill.



Tild Silali Propusts S9
CLEVELAND, OHIO, U. S. A.

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OXIDES pulverized and mixed by our special process, combined with a formula tested through ten years of successful battery manufacturing, make every particle of the GENERAL plate deliver its maximum amount of current.

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Our 90-day plan enables you to buy plates as you need them at quantity prices without loading your shelves with stock. Ask about it.

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The DeLuxe Tire Pump

The only pump that is guaranteed to give five long years of satisfactory service. Guaror sanstactory service. Guar-anteed direct from factory to user. The DeLuxe is worth more than it costs. Retail Price—pump insur-ance at 70c a year.... \$3.50

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Night driving is dreaded by A majority of every motorist. the serious accidents occur at night. Blind culverts, unbanked curves, improperly guarded bridges, hills with sharp turns all afford danger to even the most careful driver unless his car is equipped with

C. E. Z. Automatic Headlights

The best safety device for Fords. This wonderful appliance is solving the problems the spotlight was supposed to solve. The C. E. Z. Headight uses the standard lamps on the car and makes them completely meet the requirements for light and safety. Unlike the spotlight, it complies with the law in all states.

A Broad Diffused Light is insured by the fact that the left lamp throws its light in a line with the front wheels at all times. When the wheels turn the light turns. The right light remains stationary so the driver can see directly ahead.

C.E.Z. Headlight has stood the test under all driving conditions. 30-day money back guarantee. It is easy to sell because it appeals at once to every motorist who drives at night. Fits any model Ford. Installed in thirty minutes. No special tools required, No holes to bore. Full instructions packed with each device. Retails at \$5.00.

Manufactured, Guaranteed, and sold by

ADMIRAL WELDING MACHINE CO.

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1613 Locust St., Kansas City, Mo. Liberal discount to Jobbers and Dealers



NO more injuries to passengers or car from accidentally opened doors. The American Striker Plate keeps the door closed until you open it—a patented tongue in an ingenious bar does the work—

Don't slam the door—gently close it, and the AMERICAN, with an outside pressure of fifty lbs., holds it safely shut. No rattles, no one can fall out, and no door glass will break. They are in use everywhere—can be put on your car in ten minutes.

DEALERS: This new, fast-selling accessory can be a money maker for you. Made right, priced right. Write today.

Dept. A1

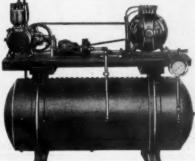
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157 W. Illinois St. CHICAGO, ILL.

American Governor Co., Anderson, Ind., U. S. A.



#### This Garage Unit Insures Uninterrupted Compressor Service



Model 21

A compressor unit that is becoming more and more popular every day —as evidenced by an ever-increasing number of new installations.

How much does it cost you to display a "FREE AIR" sign? Is it a profitable or losing investment?

The answer depends on the ability of your compressor to quickly inflate all kinds of pneumatics at negligible operating cost. If it works with this efficiency, the profits from the extra gasoline, oil and accessories sold will compensate you liberally on your investment.

The Model 21 Garage Unit has no intricate mechanism to get out of order and lasts longer—in good condition. It does its work efficiently, costs little or nothing to maintain, and holds down depreciation costs. It adds appreciably to your net profits.

Ask your jobber about it-or write us.

Machine Shop Equipment Co., Grove City, Pa.

#### Eagle Universal Aligning Fixture

Profits-Give and Take-Or Take?

Give-and-take is bad business, when it's your profits you're giving after taking. Take them, and keep them. You can do it when you have an Eagle Universal Aligning Fixture. There's never a comeback with its consequent loss from making good. Every piston, pin, bushing, bearing and pinhole is true, parallel and straight. Your profit's safe. The three arcuate

profit's safe. The three arcuate bushings let you fit every rod up to  $2\frac{1}{2}$ ". The bare arbor fits the Ford's bearing. The vise clamp provides three pressure-points to straighten bent rods. No running to the arbor press. No press to buy. Ask your jobber right now.



Eagle Machine Co.

24 N. Noble St.

Indianapolis, Indiana





#### The Ultimate Way

#### WET INTERNAL GRINDING

Wet grinding, as made possible by the Micro Internal Grinder, is as far in advance of ordinary dry grinding as the present day automobile is over the old ox team.

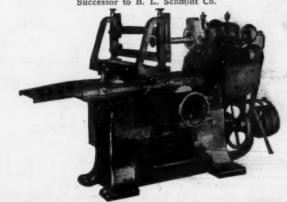


The Micro is a highly developed type of internal grinder adaptable for either wet or dry grinding, at the option of the operator, permitting highest quality of results. Its automatic action, both as to cut, feed and table travel provides the most accurate work humanly possible in exceptionally quick time.

If you're going to get a grinder, get the kind that will pay you biggest returns. Our bulletin gives full information—send for it.

MICRO MACHINE COMPANY, Bettendorf, Iowa

Successor to B. L. Schmidt Co.



#### The Garage Special

**Electric Drill and** Valve Grinder

That saves every garage or repair shop time and money.

Louisville Electric Mfg. Co.

Incorporated
Louisville, Ky., U. S. A.

C. E. Willey, Pres. J. B. McFerran, Secy-Treas.

#### **ROOF 16 OVERHEAD VALVE EQUIPMENT** For Ford and Dodge Motors **ROOF 8 VALVE HEAD FOR FORD MOTOR**



Stupendous Power Lightning Speed

Lightning Speed
Ford racing cars with
Roof Equipment are rivals
on mile and one half mile
tracks of the highest priced
racing cars. Doubles the
pulling power of the Ford
or Dodge pleasure car or
truck. Hill climbing and
general road work beyond
wildest dreams of the
owner. Complete — ready
for installation — po machine work necessary.
We are headquarters for
all speed equipment. No
mattler what you want,
write us. Racing quality
—lowest prices. A postal
card brings you complete

THE LAUREL MOTORS CORPORATION, ANDERSON, INDIANA

#### SUPER PROTECTION



It will do the work.

The New "Duo-Convex" Bumper has graceful stream lines. The convexity of the spring bars is an original, exclusive New Era feature. Priced from \$12.00 to \$22.00, according to size and finish.



ow Duplex Sport Model, an innova-design of our well-known Duplex " and "Senior." Full nickeled Medium cars \$16.50. Larger cars

Write for catalog

Protection is the very essence of the bumper idea—protection to the utmost. New Era Bumpers give super-protection (1) because of their extra width, covering fenders and lights as well as radiator, and (2) because their construction of highly resilient steel makes them virtually powerful springs, which absorb the most severe shocks. There is nyellow streak in New Eras.

7.1

yellow streak in New Eras.

GUARANTEED
UNCONDITIONALLY
FERMANENTLY
Besides SUPER - PROTECTION
they give DISTINCTION. They
are built with a grace of design
and fine finish that will lead
dignity to any car and there is
variety enough to suit all tastes.
Prices are lowest.

New Era Spring and Specialty Co. 70 Cottage Grove Ave., Grand Rapids, Mich.

## IDSHIELD

This is the only spotlight that is or can be installed THRU the windshield, therefore it is the most practical and efficient spotlight on the market. The control handle and switch are within four inches of the driver's hand INSIDE the car.

Dealers find it the fastest selling and most profitable accessory on the market in years. Write

FLOYD CLYMER MFG. COMPANY

Denver, Colorado



This handsome silent salesman free with order for three sets of Benzer Windeflec-tors.

#### For Winter Driving! BENZER REAR WINDEFLECTORS

Benzer Windeflectors are constructed of finest beveled plate glass, ¼ inch thick, with metal parts of heavily nickeled solid brass. They can be had with or without the rear-view mirror.

Let the BENZER "Silent Saleman" increase your profits on these low-priced, fast-selling Windeflectors.

Benzer Rear View Windeflectors \$22.50 Benzer Windeflectors ..... Amber Glass . .....extra, \$2.50

Jobbers Everywhere Sell Benzer Products

THE BENZER CORPORATION Myrtle, Cooper and Webster Aves. Brooklyn, N. Y.

THEN ALL advertisers demand their money's worth, all publications will provide circulation reports verified by the Audit Bureau of Circulations.

It is one of the mysteries of the advertising world that while all manufacturers demand verification of weight and quality in the material purchased, some of them still buy advertising space without knowing what they are paying for.

Such advertisers, however, are now exceptional. Most of them demand verified A. B. C. circulation statements before placing contracts.

In the case of Motor Age, the demand is immediately met.

It is a member of the Audit Bureau of Circulations.



TORCH OUTFIT NO. 13—The ideal outfit for quick soldering, radiator as, battery work, electrical soldering, light brazing, preheating, babbitting, seady the instant you need it—no waiting for soldering iron to heat.

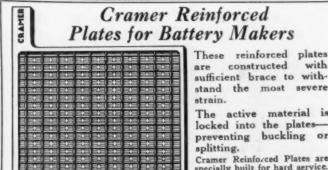
ACETYLENE ONLY. A splendid use for discarded auto tanks. Torch with 4 different tips; soldering copper, 5 ft.

ORDER TODAY FROM YOUR JOBBER, OR

Welding & Mfg. Co., 169 W. 3rd St., St. Paul, Minn.

Get our catalog of 1923 models, or see our exhibits at the Winter Shows BRUNNER MFG.CO. UTICA, N. Salez Offices: Utica, N.Y., Cincinnati.O., Kansas City, Mo., San Francisco. Ca





These reinforced plates are constructed with sufficient brace to with-

The active material is locked into the plates— preventing buckling or

splitting.
Cramer Reinforced Plates are specially built for hard service.

Send for full particulars.

CRAMER BATTERY COMPANY

Scranton, Pa.







#### Triples the Life of Ford Brake Shoes

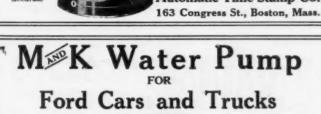
These Brake Shoo Spreaders for Fords improve the breakage by at least 100% and practically triple the life of the brake.

Worn brake aboes need not be discarded—just insert a Spreader—drive it on cam—and the result is a smooth brake needing no attention for long period.

Display board sells them—put it up where it can be seen. Nice profit even at 35c per pair. Order yours today.

Distributors—We have a special proposition to offer you. Write

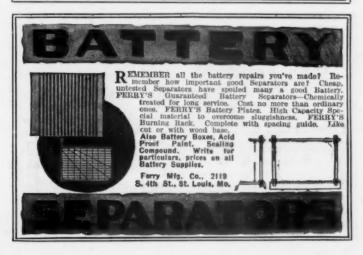
Shimer, Frey & Co.
Lewis and Hudson Sts.
Phillipsburg New Jersey





Constant Circulation Prevents Freezing and Overheating Guaranteed for Seasons Past

McDonald-Klein Co. 1604 Main St. Buffalo, N. Y.



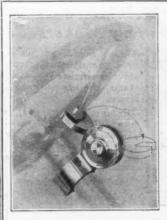
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Axle Shafts Propeller Shafts Pinion Shafts Pump Shafts

Spring Shackle Bolts Piston Pins Fan Bolts Spindle Bolts

Buick Valve Lift Assembly with Guide for Passenger Cars and Trucks Sold Thru The Jobbers

The Turner Machine & Mfg. Co., Kansas City, Mo.



#### Let Crooks Worry

The owner needn't. His steering wheel is held straight ahead. The car can be moved by firemen, but a crook couldn't take it around the next corner. That's

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Attached to steering post in five minutes.

#### SAFE - T - LOCK For Steering Wheels (Price \$10.00)

Made of heavy bronne casting with case hardened steel lock. No keys. Combination works by touch in dark. Simple, unforgetable, unduplicated. In handlest position for driver. Good profits in selling all Safe-T-Locks. Get the full line. Write for complete literature.

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#### Piston

EXCEL IN SERVICE AND EFFICIENCY

Sold by All Jobbers

BURD HIGH COMPRESSION RING CO., ROCKFORD, ILL.



#### \$100 Handy Hat Holder \$100

The newest, cleverest, most needed little accessory produced in a rear.
Attaches in a moment with two special nickel screws to top bow of open or closed cars. The polished aluminum bars slide to adjust the special cord which holds your hat, parcels, umbrella, raincost, etc. A dollar bill brings it to you prepaid. Liberal discount to dealers and agents.

Handy Appliance Co.,

Springfield, Ohio



#### For All Cars and Trucks

Write for Catalog and Prices

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Standard tools for fast, accurate work in refacing, reseating and grinding any and all size valves, also Flexible Shaft At-

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For all cars and trucks, most tractors and many stationary engines. Bronze backed babbitt lined and solid babbitt die cast. Porosity eliminated by special process. Send for name of distributor nearest you. Distributors learn of our propo-sition.

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International Harvester Company of America

Chicago U. S. A.

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Guaranteed to do a "better valve grinding or bearing fitting job in half the time." Get some from your jobber—or write us.

The Zip Mfg. Co., Denver The Zip Abrasive Co., Cleveland



Garage Tools Ask your Jobber. tachment.



Like a Pocket in a Shirt

Sales Dept.
Standard Motor Parts Co.,
1420 S. Michigan Ave.,
Chicago, Illinois



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Won't Leak Because They're Sealed With Oil

No-Leak-O Piston Rings are making money for dealers everywhere. Their "oilSRALing" groove-found only in No-Leak-O-packs an oil film in between piston and cylinder walls like "packing" in a pump. Oil and gas stay where they belong. National advertising is helping the dealer sell No-Leak-O by teaching the motorist the lesson of more mileage on less oil and gas.

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A better bumper at a better price with Underwriters' Approval

NEW YORK WIRE & SPRING CO. P. O. Box MA-43, Uptown Station. Hoboken, N. J.



D-G DRAFT & DUST PROTECTORS FOR FORDS

Prevents cold drafts from rushing in rough openings around foot levers and nergency brake. Does not interfere with tick removal of floor boards. \$1.50 at price.

thorized jobbers and dealers:—Write your special discount,

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Portable Electric Tools

With the Pistol Grip and Trigger Switch

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Just use a natural, easy pump action

SIMPLICITY VALVE GRINDER

Price

\$2.50

The simplest, sturdiest speed grinder made — so designed that you can do with it whatever the hardness, size and conditions of the valve requires. With a natural, easy pump motion, the Simplicity Valve Grinder furnishes the repair man with a tool the sturner and the sturner of the valve at all times. Stroke never stops twice at the same place. There is no complicated series of gears, cams or pins to wear out.

Carried in stock by all jobbers.
Our literature gives the details.
Universal Equipment & Supply
N. Y.

#### A Straight Line to Your Automotive Markets

ONCENTRATE your sales effort on that section of the automotive industry that your product serves. Donnelley has compiled

your product serves. Donnetely has complete a comprehensive index consisting of mailing lists covering each of the 14 separate trade classifications within the automotive field. Our list of 1922 automobile owners is also complete and up to date.

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#### The Reuben H. Donnelley Corporation

Mailing Service Department

334 E. 21st Street

Chicago, Illinois

#### Everybody Signals



Two luminous arrows—one on front fender, one on rear fender—left hand side—controlled by switch on steering post—makes your next move clear

The details—from your jobber or direct —will interest you.

The Motor Products Co. Norwalk, Ohio

#### Why This Single-Acting Long-Barrel Pump Sells Fast

Car owners want a pump that will give them the desired air pressure with as little work as possible. And this is a decided point in favor of the Springfield No. 1 Single-Acting Tire Pump. No effort on the "up pull"—intake stroke. And on the downward—charging stroke, the motorist works in a natural position; reducing effort to a minimum.

Springfield construction insures a large charge at each working stroke. 27 in. steel barrel—26 in. hose, tested at 200 lbs. — malleable iron base with ball air check.

Learn the other features from our interesting data—sent on request.

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Springfield,

#### RANITE Best For Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.



FOR 33 YEARS THE STANDARD IF IT'S PARANITE IT'S RIGHT

Quality jobbers handle quality cable-that's PARANITE.

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The Bearings Company of America—manufacturers of Thrust Ball Bearings, Angular Contact Radial Bearings, Angular Contact Thrust Bearings—Bearings made to your B/P's and requirements—Your present Bearing sizes duplicated.

The Bearings Company of America, Lancaster, Penna.

Detroit, Mich., ( Office,





#### ALVORD QUALITY TOOLS



Taps, Dies, Cutters, Drills, Reamers Send for Catalog ALVORD REAMER & TOOL COMPANY Millersburg, Pa.



PUMP

#### THE HYDRAULIC CONTROL

More than a Shock Absorber because it fluid-cushions all move-ments between the body and the chassis—gives a new experience in riding comfort.

Good distribution territory is still to be allotted. For information write to

AUTO SPRING CONTROL CO.

A better, quicker, engine-operated tire pump that sells for less. A great dealer opportunity. Write for details today.

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> TESTING EQUIPMENT ELECTRICAL SERVICE STATIONS

for Catalog P. J. DURHAM CO.
New York City

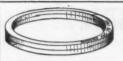
#### 51-6/10 MILES ON A GALLON OF GAS

It is the official world's record-breaking test with Ford Touring car. The new 1922 Stromberg Carburetor and Hot Spot did it—made this marvelous mileage possible.

Tens of thousands of Ford owners are now obtaining more miles on a gallon—quicker getaway—easier starting—increased power and speed—all because of having their cars so equipped.

Live dealers are requested to write for facts pertaining to territory.

Stromberg Motor Devices Co. 64 E. Twenty-Fifth St. Dept. 27



Send

#### Distributors—Good Money

can be made in the new territories now opening for the sale of PERFECT SEAL—the piston ring with the position-retaining shoulder. Write today for our good proposition.

Perfect Seal Redin-Ekstrom Co. **Piston Rings** Rockford, Ill.

Taps · Dies · Drills · Reamers · Gages Screw Plates Machine Tools Milling Cutters Little Ciant Pipe Wrenches





As people say everywhere

**United States Tires** are Good Tires



#### off on Replacement Parts for Fords

We carry in stock ready for shipment over 400 parts. Write or wire your order and cash in on this big additional profit. All parts posi-tively guaranteed. Ask for catalogue.

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ROBERT BOSCH MAGNETO CO., INC.
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WEIGH LIGHTEST · FIT TIGHTEST Regrinders, Repair Men, Dealers
Write for literature, price list and liberal
proposition. Prompt service and delivery
on all standard and special oversizes up
to .065. Over 600 models.

THE KANT-SKORE PISTON CO., Cincinnati, Ohio, and Kansas City

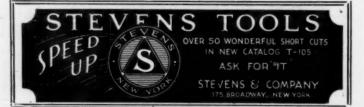


#### SAY "W. & C."

and Your Jobber Will Cive You the Most Successful Time-Tried Shock Absorber for Fords W. & C. Shock Absorbers Sell

P. H. WEBBER COMPANY Hoopeston Illinois







#### CARTER OIL GAUGES

For Ford, Chevrolet and Dodge—Only \$3.75 Buick, Oakland and Chandler—\$5.00 ACCURATE—EASY TO INSTALL—GUARANTEED

we gauge to dash or instrument board; connect copy with elbow in place of lower petocok. No oil pass t tube or cause. No moving parts, floats or plunge to to sell; easy to install. Big money-makers.

Order from your jobber or write for discounts.

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Standard Equipment on 30 of America's Foremost Cars

Write for Prices.

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Automobile and Radio batteries charged for a nickel. Ten million car owners and five million radio fans are prospects for

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UNIVERSAL MOUNTABLE VENTILATOR is a best seller

because it has a flexible base flange that is easily fitted to any cowl on that is case, any car.

Very easy to install. Can be put on in few minutes.

Write today for particulars.

HIGBEE-ORNE CO., Inc.



Compressors; Gasoline and Oil Storage Sys:
Heavy Metal Storage Tanks; Oil Burning
ms. Furnaces and Forges; Oil Filtration
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WAYNE TANK & PUMP COMPANY,
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#### DAYTON AIR COMPRESSORS

Automatic Control. Automatic Release. Start against no load. Style E-2: 234 cu. ft. per minute. 140 lb. pressure. Tank 16x36, 32 gallon. 25 ft. hose with air chuck. ½ H. P. Motor.

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#### Make Every Greasy Wheel Pay You a Profit!



R & R Automatic Grease Retainers make it impossible for grease to leak out of Ford and 490 Chevrolet hous-

ngs.

No Special Tools Required to Install
Formerly retailed at \$1.25 each, now
reduced to \$1 a Wheel or \$2 for set of 2.
Write today for dealers' discount.

THE MACORVEY COMPANY, 237 Fourth Ave., Pittsburgh, Pa.

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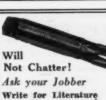


CLUTCHES, TRANSMISSIONS, CONTROLS, DIFFERENTIALS

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Direct Factory-to-Dealer Distributors of GUARANTEED TIRES AND TUBES Michigan Ave. & 18th St., Chicago

Exclusive national distributors of the famous KINGSTON, ANDOVER SUPER-SIZE, CAMERON CORD, DOUGLAS CORD, STRATFORD, SEXTON-SUPER, CLINTON "12" CORD, DUVALRAND, TEMPLETON CORD, AND HOMESTEAD TIRES.



WATERVLIET SPIRAL **EXPANSION REAMERS** 

Turn of screw gives even, accurate expansion. Cuts smoothly, stays sharp. Leaves full bearing surface with mirror-like finish.



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Warms any car, open or closed. No odor, smoke, dust or noise, Easily installed, operated and cleaned, Sells quickly. Write for our attractive trade

THE NORWALK AUTO PARTS COMPANY

U. S. ASBESTOS Also Durabestos & Motobestos BRAKE LINING

Unequalled in its Performance

Write us

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Our engineering department will be glad to help you with your repair prob-

PETERS ENGINEERING CO.
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UNIVERSAL HOSE CLAMP Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

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Double check. Pay only for the gas you get. Makes satisfied customers. Write for catalogue.

BEACON VISIBLE PUMP CO.

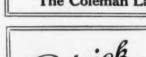




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Save the Gas and Save the Oil

Foster-Johnson Reamer Co. Elkhart,



**COLEMAN** Quick-Fill Tire Pump "More Air with less Strokes"

Write for Prices The Coleman Lamp Co., Wichita, Kans.

Exert an equal pressure on the cylinder wall at every point of its circumference

SELL OIL FROM THE CURB

Correct Measure Co. Inc.

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#### Tasco Visible Gas Gauge For Fords

Tells instantly supply of gas. Simply insert instead of regular gas cap. Retails for \$1.00. Every Ford owner wants one. Order from jobber or direct.

LIBERAL DISCOUNT

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Akron, Ohio



There is a Harvey Steel Disc Wheel in the various styles which we make for each size of car at interesting prices.



Write for particulars Wilkening Mfg. Co. 613 N. 15th St. Philadelphia, Pa.

Rim & & Wheel Co., Inc. 25 E. Jewett Ave., Buffalo, N. Y.







"Bull Dog" Foot Accelerators for Fords

RUBBER COVERED PEDAL MAT BINDER NON-SLIP FOOT REST

The W. H. Thomas Mfg. Co. Spencer, lewa Sales Representatives The Fulton Co., Milwauke





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the Testing and Repairing of automobile Electrical E-int as a Profitable Business," which explains the com-moo line and how to start and continue the ever incre-siness of giving up-to-the-minute electrical service. filt-making possibilities of this business are also gone-length.

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Main Office and Works: Springfield, Mass.

Branches: New York, Chicago, Detroit, San Francisco Over 500 Service Stations in 500 Centers



Engine driven tire pumps are carried as standard equipment on leading makes of cars.

Kellogg Mfg. Co.,

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Keystone Expansion Piston Pin Aligning Reamers
Ask for 1922 Reamer Bulletin

KEYSTONE REAMER & TOOL CO.

Millersburg, Pa.

New York City



Your Shop Equip

**HOYT Electrical Testing Instruments** Burton-Rogers Co., Boston, Mass.





FOR FORD CARS

Makes riding and driving a pleasure. Eliminates road shocks and hard steering, spring breakage, shock absorbers. Write for our money making dealer W. D. LOWE & CO. 204 Mound St..





K-M Mechanical Windshield Cleaners \$1.75 100% EFFICIENT—CLEAN BOTH SIDES OF THE GLASS
classy appearance makes them a favorite with car

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Jobbers and Dealers there isn't a better selling safety appliance on the market today. Quick sales and rapid turnover are assured.

THE K-M MANUFACTURING COMPANY

Factory and General Office TOLEDO, OHIO



#### The HarWard Guarantee

We will exchange, free of charge, any HARWARD Piston Ring that does not show contact with cylinder wall all the way round when the car has been driven five miles. Send for booklet.

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RED GIANT RIM TOOL

As we have reduced the price on Red Giant Rim
Tools to \$3.25 to dealers, you cannot afford to let
this opportunity pass to get a real rim tool at a
chear price.

Tools to \$3.25 to users, this opportunity pass to get a real rim two this opportunity pass to get a real rim two the cheap price. Sold in every state in the Union, Canada, Mexico. Holland, Belgium, Denmark and the Hawaiian Islands. If your jobber cannot supply you, do not take something "just as good," but order direct. RED GIANT TOOL CORP.

Lynchburg, Va.



#### PRIME WITH HEAT

#### POMEROY PATENTED GASAFIER

at \$5 retail guarantees easy starting in coldest weather Now entering fifth selling year.

DEALERS: Order early.

POMEROY ELECTRIC CO., Inc., Mfrs., 44 E. Main St., Rochester, N. Y.

The Borg & Beck Clutch

Over 1,500,000 in Use Write for instructions for adjusting Borg & Beck Clutches. The Borg & Beck Co., 920 S. Michigan Ave., Chicago



#### DOUBLE SEAL **OIL-CONTROL-PISTON**

This hook-shaped groove catches the excess oil and returns it to the crankcase through holes in the bottom of the groove. Oil troubles are unknown with this piston. Used by many car builders as standard equipment. Write for our dealer proposition.

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Heart of the Ford

50101

White Brass Castings Company

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One of the most successful and best known Sales Executives in the Automotive Industry is available to assist a responsible automotive manufacturer to secure greater distribution and a larger volume of business. Personally acquainted with every phase of automotive activity. Responsible for some of the largest successes in the industry. Can make investment if conditions warrant. Will be glad to hear from both large and small manufacturers. Address: Sales Executive, 241 Engineers Bldg., Cleveland, Ohio.

K-D Parallel Jaw Valve Spring Lifters 

Does Your Jobber Carry K-D Specialties

K-D MANUFACTURING CO.,

K-D No. 100 Cut-Out Pedal 

ers Write NOW for Discounts

Lancaster, Penna



#### Battery Charging Pays MONTHLY PROFITS

Only \$20 brings you an HB Charger. Profits quickly pay balance on easy terms. Butle Now. Bury sea-son fust starting. Ask our advise. No obligation. Ask about Constant Potential 8 hour charging, air compressor, motor buffers. HOBART BROS, CO., Box AR 75, Troy. Ohio.



The Dempsey Process—endorsed by leading automotive authorities—gives you a better and more profitable hold on the business in your town.

Learn about the Dempsey Cycle.

Details on request.
The Dempsey Cycle Company,
Philadelphia, Pa.

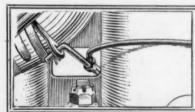


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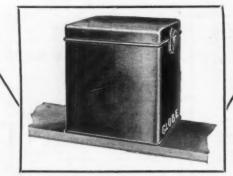
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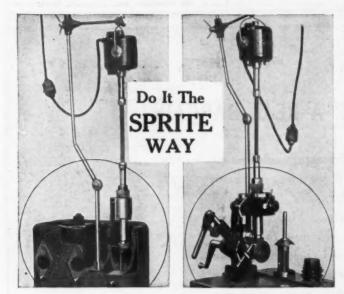
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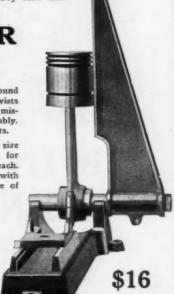
Complete equipment with Ford size arbor is \$16.00. Bushings for other size crankshafts \$1.00 each. Your jobber can supply you with this unusually low priced piece of equipment.

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The boulevards and highways in every section of the country reflect the steadily increasing success of Moon Cars and Moon dealers. Moon sales in 1922 more than doubled any previous year. We have been compelled to double our manufacturing facilities in order to take care of this remarkable de-

mand, which continues into the new year with promise of even greater gains.

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 1,895
 Six.58—Four-door Petite Touring Sedan 2,585

 Six.40—Tourlux.
 1,445
 Six.58—7-passenger Touring.
 1,785
 Six.58—Suburban Sedan.
 2,68

 (Prices f. o. b. St. Louis—Disteel wheels extra)
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The MOON